All you want to know about the BBC MICRO!

THE Sumber 4 June 1984 F1 IN ICRO USER

YOU can win Acorn's 6502 SECOND PROCESSOR

- See Page 105



A game that challenges your driving skills



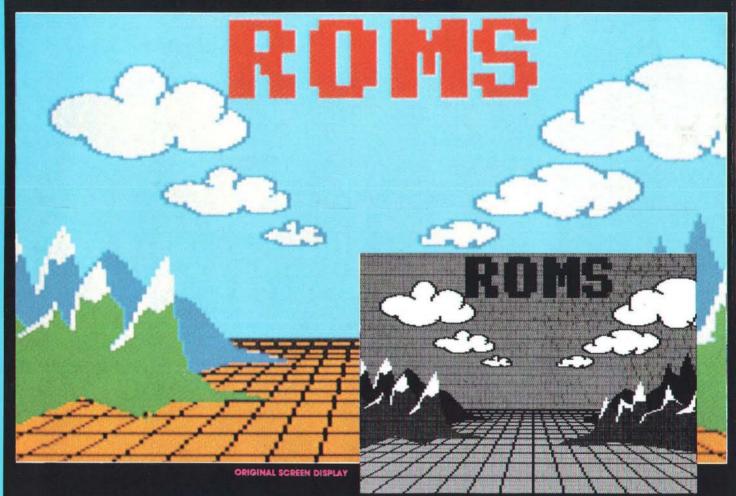
low to turn your BBC Micro into In IBM PC

fow to debug nachine code rograms

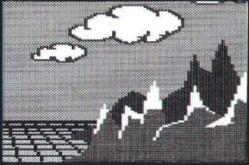
our business ackages eviewed



For the BBC Micro



WHOLE SCREEN DUMP



ENLARGED PART OF SCREEN



*DEFINE IN ACTION

Printmaster

Joining our already extensive range comes PRINTMASTER a sophisticated printer handling utility ROM. PRINTMASTER will be released in several versions catering for each of the most popular printers on the market. This first PRINTMASTER ROM supports a range of EPSON printers. MX80, RX80, FX80 and other compatible printers.

All commands in the ROM must be preceded by an asterisk and can be used like all normal operating system commands from within BASIC programs etc. It is also possible to use them from WORDWISE and other language ROMs.

PRINTMASTER supports three types of screen dumps. The most flexible (*GDUMP) allows any graphics on the screen to be dumped onto the printer. This will operate in any mode, the colours being displayed as shades. Any part of the screen may be printed at any position on the paper in any one of four orientations. It is also possible to magnify the screen dump by any factor x2, x3, x4 etc.

A special feature allows true Mode 7 screen dumps with TELETEXT text and graphics, colours (as shades), double height etc.

- \star TDUMP allows any text mode to be dumped and \star FDUMP will automatically print the contents of a file on disc to the printer WHILE the BBC machine is doing other things, running other programs etc.
- \star DEFINE allows the redefinition of any user definable character in the simplest possible manner. See screen photo opposite. \star U SAVE and \star ULOAD can be used to save or load all user definable characters.
- \star WINDOW allows the user to interactively define a graphics window, this controls the part of the screen printed in \star GDUMP this is a very much easier method of defining graphics windows than the normal VDU statement.

The above list is only a fraction of the commands in the PRINTMASTER ROM. Others include \star CENTRE, \star UNDERLINE, \star ITALIC, \star MARGIN etc. etc. which provide total control over the printer. Order as PRINTMASTER (Epson).

£33.35 incl. VAT and p&p.





ROM SOFTWARE INC. VAT Printmaster
Disc Doctor
Termi (terminal emulator)
Graphics Extension
Acorn Speech System Upgrade
HCCS Forth HCCS Logo Forth HCCS Pascal HCCS Excal INC. VAT BOOKS n Disc Companion Creative Graphics Graphs & Charts Lisp Manual LISP Member Forth Manual BCPL Manual Discovering BBC Micro Machine Code BBC Micro Disk Manual Using Floppy Disks with the BBC Micro PROGRAM POWER INC. VAT Killer Gorilla Cybertron Mission Chess B UXB Danger UXB
Escape Moonbase Alpha
Felix in Factory
Felix & Fruit Monsters Nemesis Bumble Bee Wizards Challer Jet Power Jack Positron Demon Decorator Alien Swirl Alien Destroyers Ghouls Moon Raider The Mine Hell Driver Labyrinths of LaCoshe SUPERIOR SOFTWARE INC. VAT Hunchback Overdrive Battletank Cosmic Kidnap Star Battle Moon Mission Percy Penguin Boris In The Underworld OPUS INC. VAT BUG-BYTE INC. VAT DYNABYTE INC. VAT BBC/ACORNSOFT INC. VAT Algebraic Manipul Arcadians Business Games Castle of Riddles Creative Graphics Countdown to Do Countdown to De Forth Graphs & Charts Hopper Lisp BCPL (Rom + Disc) Missile Base Meteors Monsters Monsters Peeko Computer Planetoid Rocket Raid Rocket Raid Spooker Sphinx Adventure Sphinx Adventure Starship Command Tree of Knowledge Snapper Shirley Conran's Magic Garden Personal Money Management Draughts and Reversi Wordhunt White Knight II Vutvoe Vutype
Tax Calc
Beyond Basic
Toolbox
Canyon
Record Keeper Doctor Who ACORNSOFT MIRLE NOW IN STOCK

SOFTWARE INVASION INC. VAT

INC. VAT

INC. VAT

INC. VAT

INC. VAT

Eagles Wing Spooks and Spiders 3-D Bomb Alley

VISIONS

PSION

Snooker Digger Daredevil Dennis

MICROBYTE

Vortex Attack on Alpha Centauri

MELBOURNE HOUSE

SOFTWARE FOR ALL Stock Control (C/D)

tock Control (C/D) avoicing/Statements (C/D) ales/Purchase (C/D)

COMPUTERAMA SOLID STATE JOYSTICK INTERFACE

INTERMEDIATION FIRE TEATURE

** a totally new concept in joystick control for your BBC

re. Simply plug into the analogue port, and connect AN's

i type joystick for instant joystick control. FREE keyboan

version programme allows joystick control of

poard-only games. No memory-conflicts with this one—

to our unique Relocatable Code feature. ORDER

DAY. Only a few available. Demand if bound to be high. with RAPID-FIRE feature

50p Carriage

RING FOR

LATEST

PRICES.

MANY

TORCH Z80 **DISC PACK** WITH OVER £1,100 OF REDUCTIONS SOFTWARE **EXPECTED** FREE

£125) rur ns BBC Mici ngrammes up to twice as fast, es 32K for graphics AND 48K fo

NOW ONLY £799 INC. VAT

Software includes:

PERFECT WRITER PERFECT
SPELLER PERFECT CALC
PERFECT FILER TORCH NET.
The TORCH Z80 DISC PACK is the most powerful BBC Micro disc most powerful Bbc and upgrade available, it provide of storage plus a Z80 Secon Processor running Torch's of the compatible operation. /M compatible operating tem. Clip this ad to your order serve free 40/80T converter

Programme

NEW TORCH ZEP10 PACK. Add
Torch Power to any 80 track drives.
Complete 2nd Processor AND Free
Perfect software worth £1000
ONLY





ITEMS



16 Roms.

16K Battery backed CMOS Ram

No soldering required to fit

Full buffering of address and data busses – prevents data bus loading problems associated with unbuffered boards.

EPSON FX80

A SUPERB PRINTER AT A SUPERB PRICE



s most popular of HIGH RFORMANCE dot matrix prite s all the features you could ask

160 cps, 11 × 9 matrix proportional spacing. Normal, Elite & Italic Character Tractor & Criction Feed. 10"

Tractor & Tracto

Condensed & Double Width Printing
 Super & Subscripts.
 Dot Addressable Graphics.
NOW AT THE AMAZING PRICE OF



QUICKSHOT II **BBC MICRO** JOYSTICK

nelocatable code fe at it WORKS with games than any other similar interface. This SELF-CENTERING JOYSTICK, works even with

£19.95 + £1.55 p&p

WE ACCEPT INSTITUTIONAL **EDUCATIONAL ORDERS**



ATPL SIDEWISE ROM **EXPANSION** BOARD

£4370

MAIL ORDER No Stamp Required
Post your order today to
COMPUTERAMA
DEPT. MUG FREEPOST
STAFFORD ST16 2BR
OR TELEPHONE OUR MAIL
ORDER HOT LINE With your
ACCESS or VISA number, we will endeavour
to despatch immediately - (0785) 41899

Call in-today. Home Computer Centre for the BBC Micro enthusiast Send large SAE for further details of

licro's, Monitors, Disc Drives rinters £8.00, Books £1.00 each assette Decks £2.00, Leads and oftware 50p/item



INC. VAT STAFFORD Tel: (0785) 41899

STOKE-ON-TRENT 11 Market Square Arcade, Hanley Tel: (0782) 268620

SHREWSBURY 13 Castle Gates Tel: (0743) 60528

BBC INC. VAT 199.00 399.00 ACORN ELECTRON BBC Micro Model B BBC Micro Model B + Double density DOS 489.00 Double density DOS
BBC Micro Disc Upgrade
BBC Micro A-B Full Upgrade
BBC Micro Teletext Receiver
BBC Micro 280 2nd Processor
BBC Micro 6502 2nd Processor
Double Density DOS Upgrade 489.00 P.O.A. 95.00 225.00 T.B.A. T.B.A. DISC DRIVES INC. VAT VL Dual 100K
Pace Single 100K
Pace Single 40/80T D/Sided
Pace Dual 100K
Pace Dual 40/80T D/Sided
Torch Dual 40/80 T D/Sided
Pace 200K 40T D/Sided 340.00 169.95 282.90 338.00 573.95

HOBBIT FLOPPY INC. VAT MONITORS INC. VAT Microvitec 14" Colour Sanyo 14" Colour Fidelity 14" Colour Monitor Grundig 14" Colour TV/Monitor Sanyo 12" Green Phoenix 12" Hi-Res Amber 229.00 269.00 199.00 309.00

89.00 29.85 INC. VAT 269.00 299.00 pson RX80 pson RX80FT pson FX80 299.00 389.00 569.00 229.00 286.00 449.00

MISCELLANEOUS INC. VAT Sanyo DR101 Data Recorder 39.95 assette leads - all types 2.80 omputerama Joystick interface Quickshot Joystick (FOR BBC MICRO) 19.95 9.95 5.95 28.75 1.95 14.95 Printer Cable (Parallel) 1. BBC Micro Deluxe Cover Light Pen Data Cassettes 5 x C20/C15

ORDER A COMPLETE S GET ALL LEADS F CLARES STEM -

The Plug Power Filter

INTERNATIONAL

INC. VAT plica II (Disc Only) he Key (Disc Only) 12.95 INC. VAT DR SOFT nulato AMCOM INC. VAT GEMINI GAMES INC. VAT INC. VAT GEMINI Combination Packs 1, 2, 3, 4 Data Base
ADVENTURE

SOFTSPOT

H. SOFT (WATFORD) ALLIGATA Blagger HEWSON HEWSON Air Traffic Control CRL Test Match A&F Chuckie Egg Cylon Attack

AARDVARK Zalaga MIRRORSOFT With The Mr. Men MICRODEAL Air Traffic Control Space Shuttle (C D)

MRM SOFTWARE Q-Man Q-Man's Brother Diamond Mine

INC. VAT 7 95 9 95

INC. VAT



Vol. 2 No. 4 June 1984

Managing Editor Derek Meakin

Features Editor Mike Bibby

Technical Editor Mike Cook

Production Editor Peter Glover

Layout Design

Heather Sheldrick

Advertisement Manager John Riding

> Advertising Sales Mike Hayes

Marketing Manager

Sue Casewell Editor-in-Chief of Database Publications:

Peter F. Brameld

Tel: 061-456 8383 (Editorial) 061-456 8500 (Advertising) 061-480 0171 (Subscriptions)

Telex: 667664 SHARET G Prestel: 614568383

Published by: Database Publications Ltd, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Subscription rates for 12 issues, post free:

£14.50 - UK

£15 - Eire (IR £18)

£20 - Rest of world (surface)

Rest of world

(airmail)

ABC Member of Audit Bureau of Circulations

The Micro User welcomes program list-ings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

c 1984 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles, listings or advertisements.

The Micro User is an independent publication and neither the BBC nor Acorn Computers Ltd are responsible for any of the articles in this issue or for any of the opinions expressed.

Trade distribution in the UK and overseas: Contact Steve Fletcher, Circulation Manager of Database Publications at the above address or telephone him on 061-480 4153.

CONTENTS

NEWS

Keep in touch with the latest happenings in the growing world of the BBC Micro.

BEGINNERS

Passing parameters to procedures may sound daunting. Our series for novices makes it easy.

MONITOR

A machine code monitor that makes debugging those assembly language programs simple.

QUADLINE

An intriguing logic game. You and the computer battle to get "four in a line".

ADVENTURES

Our forthright columnist takes her usual critical look at the world of adventures.

BUSINESS

Spotlight on the latest software designed to exploit the BBC Micro's business capability.

WORKSHOP

Confused by TOP, HIMEM and LOMEM? We take you through it, page by page.

OLYMPICS

Play against the world's best at Los Angeles and you can do it on your BBC Micro.

ROAD RACER

Take the wheel in this stunning 3-dimensional recreation of the arcade classic.

SOFTWARESCENE

The latest software releases assessed by our team of frank and thorough reviewers.

PROBLEM PAGE

Mike Cook explains the things you've always wanted to know but been afraid to ask.

103

FUN CLASSROOM

Educational software can be fun and factual – our program for teaching areas proves it.

105

COMPETITION

Share your knowledge of Basic keywords and win Acorn's amazing 6502 second processor

106

SHOWTIME

Your invitation to the next Electron and BBC Micro User Show – with a special offer.

110

TOOLKIT

Make the most of your disc system. We show you the OSBYTE calls Acorn didn't.

11

HARDWARE

Extra RAM for your BBC, robot arms and a single-handed keyboard – we examine them.

122

SPOKES

Simple and short, this entrancing program shows the BBC Micro's graphics capabilities.

125

SPELL

If your child has spelling lists to learn, this listing should make it easier for everyone.

163

ACTION REPLAY

Now at your dealers – a re-creation of top games from *The Micro User*.

-Page 67

-Page 65

- Page 66

Take a close look at

the ever expanding world of micro communications . . .

development on the micro scene is the bulletin board. We tell you how it works.

Log-on to Microweb. The Micro User's own bulletin board comes on line

A thorough appraisal of an

communications ROM, and the modem that goes with it.

A special offer to get you

started in communications – an all-in package that saves you a handsome £35.

24 hours a day.

exciting new

Page 64

Today's most exciting

164

ORDER FORM

From back issues to covers, cassettes to cases, everything you need is here.

175

ARCADE CLASSICS

The top-selling cassette from *The Micro User* featuring old-time favourites.

177

MICROMAIL

The page you write yourself. Just a small selection from the flood of letters pouring in.

DARK SCREEN

The Technology that puts NOVEX light years ahead



The revolutionary NOVEX D/S monitor combines superb resolution graphics, colour balance and image clarity which moves existing monitor technology into the past. NOVEX advanced technology doesn't stop there; just push the unique green switch and instantly convert your monitor to a D/S green monochrome monitor for programming and word-processing applications.

NOVEX monitors (recommended for use with the BBC Micro and approved by the 'Test Bureau' for education) are specifically designed with both RGB and PAL inputs to cater for the majority of small computers. The durable metal case (in BBC Micro colours) houses an internal speaker with independent volume control, together with carrying handles for greater safety when moving the monitor around.

The complete range of NOVEX monitors is available through your local micro dealer, and backed by Display Distribution's after sales support. Dealer enquiries welcome by contacting Charles Martin on 01-891 3668.



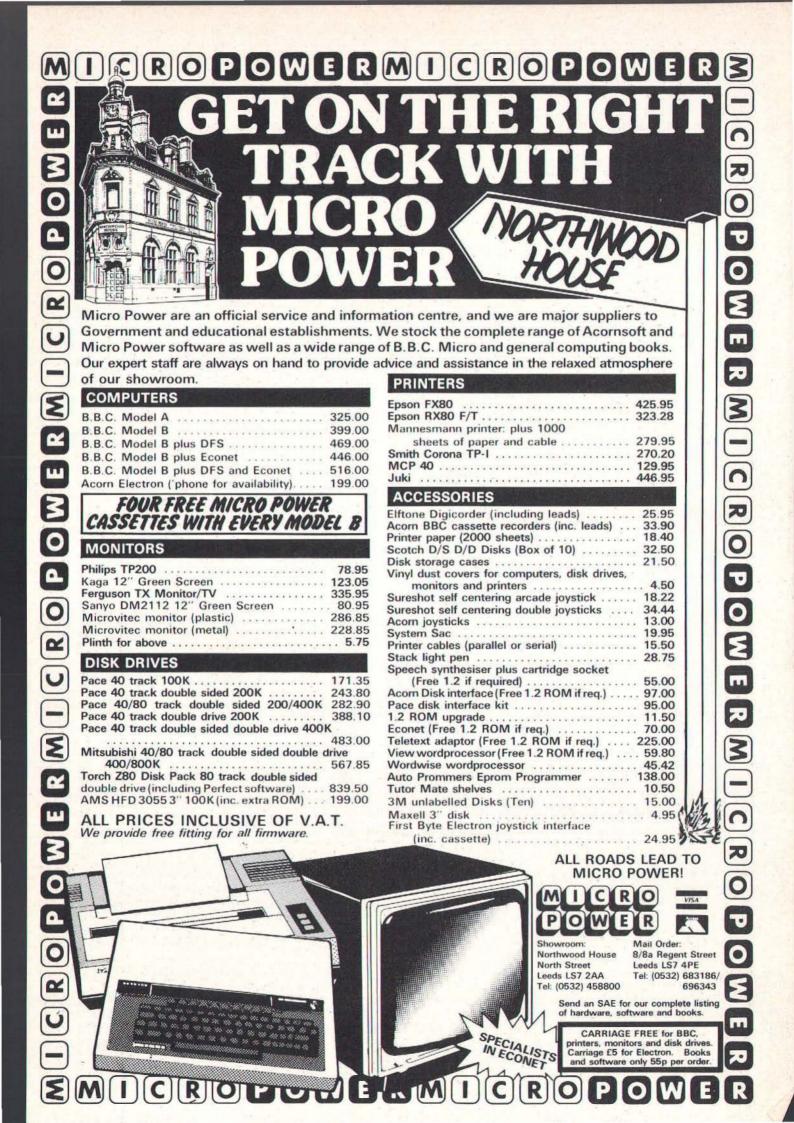
DISPLAY DISTRIBUTION LTD.

35 Grosvenor Rd., Twickenham Middlesex. Telephone 01-891 1923/1513 Telex 295093

DISPLAY DISTRIBUTION.....
CARE OF EVERY DETAIL, RIGHT DOWN TO THE PRICE



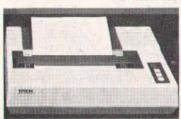
Excl. VAT & Carriage



TECHNOMATIC

BBC Computer & Econet Referral Centre 01-452 1500 01-450 9764 01-450 6597 Telex 922800

PRINTERS



We have a range of printers that will meet most requirements.

EPSON—the high quality dot-matrix printers that set the standard in the industry—versatile printers that provide the optimum in performance & reliability.The RX80/FT provides all standard printing

& graphic functions, (single sheets & perforated paper), with the de-luxe FX80 giving in addition proportional printing, italics, programmable characters etc. The FX100 also allows the use of 15" wide paper.

The **JUKI** daisywheel provides a quality normally found in printers costing far more. Printer cables, interfaces, ribbons, paper etc. are all normally available from stock.



TORCH Z80 DISC PACK

The proven upgrade for the BBC Micro. Comprising 2 x 400K disc drive, Z80 processor with 64K of memory, and a CP/M compatible operating system, it opens up the vast range of CP/M software, including advanced languages, scientific and business applications. The system is supplied complete with the PERFECT software range including PERFECT WRITER, PERFECT-SPELLER, PERFECT CALC, and PERFECT FILE. Full TORCHNET software is also supplied allowing sophisticated networking between other units. This will allow access to information, and communication, between up to 254 upgraded BBCs.

NEW TORCH Z80 PACK PRICE £699. SOFTWARE PACKAGE INCLUDES Z80 BASIC

Phone for details about the 20Mbyte Hard Disc Pack, and the 68000 Hard Disc Pack with UNIX Operating System.

NOW AVAILABLE - The TORCH Z80 SECOND PROCESSOR CARD - for those who already have suitable disc drives. The card is supplied with all the free software, as detailed above, presenting a very attractive package. £299.

RH LIGHTPEN

The Acorn-approved superior design, with a programmable 'push-tip' switch, status indicator LED and an interface box. Supplied complete with manual, full software and basic demo programs. £39(c). Colour graphics.Cassette £8.65(d) Disc £10(d).

MICROTEXT

Developed by the National Physical Laboratory, is a program-ming system designed to simplify the production of a wide range of man-computer dialogues. Using MICROTEXT, an expert in any field can construct their own complete courses of computer-based instructional material. Applications include interviewing systems, teaching packages, training courses and interactive demonstrations and simulation. Cassette £43.35(c) Disc £52(c).

GRAFPAD

A low cost graphic-tablet offering the performance and durability required for the business, industrial and educational user. It is small, accurate & reliable. Working area: 240 x 192mm + Menu area. £125 plus CAD program.

TELETEXT

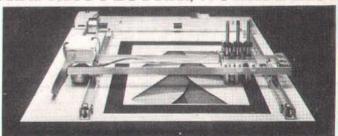
Converts your BBC into a fully fledged Teletext Terminal. In addition to normal reception of Teletext pages, it is able to 'download' software as well as saving standard pages on any of the four TV channels. £196.

ACORN COMPUTER SYSTEMS	4.
BBC Model B	£348 00a
BBC Model B + Econet	£389 00a
BBC Model B+DFS	£429 00a
BBC Model B+DFS+Econet	£470.00a
Acorn Electron	
BBC Teletext Receiver	
BBC Dust Cover	
Pair of Joysticks	C11 70e
	£11.70¢
TORCH Z80 SYSTEM	
TORCH Z80 Disk Pack	£699.00a
TORCH Z80 Disk Pack TORCH Z80 2nd Processor Card	£299.00a
UPGRADE KITS	
A to B Upgrade Kit	£75 00d
Installation	
DFS Kit.	
Installation.	
Econet Kit	
Installation	
Speech Kit	
Installation	
	£10,00
ECONET ACCESSORIES	NAME OF TAXABLE PARTY.
Printer Server Rom	£41.00c
File Server Level 1	£86.00c
File Server Level 2	£216.00b
Clock + 2 Terminators	
Econet User Guide	£10.00d
BBC FIRMWARE	
1.2 Operating System	£750d
Basic II Rom.	
View Word Processor Rom	£52 00c
Wordwise W/P Rom	
Beebpen W/P Rom	
BCPL ROM+Disc	C87 00h
Disc Doctor Utility Rom	C28 00c
Termi Emulator Rom	
ULTRACALC Rom (BBC Publications)	
Gremlin debug Rom	
Computer Concepts Graphics Rom	C28 00c
EXMON.	
TOOL KIT.	
Printmaster Rom	
Communicator Rom	
BBC ANCILLARY HARDWARE	
EPROM Programmer	
Smartmouth Speech Synthesiser.	
RH Light Pen	£39.50b
"Time-Warp" Real-Time	
Clock/Calendar ACORN IEEE Interface ANKOI	£29.00b
ACORN IEEE Interface ANKOI	£282.00c
	A STATE OF THE PARTY OF THE PAR
II DDICEGEV	CIID

EDGON EV DO	
EPSON FX-80£	350.00
EPSON RX-80 FT	250.00
EPSON FX-100	
EPSON DX-100 £	460.00
Printer Sharer + Cable Set	00.883
SEIKOSHA GP100A	160.00
JUKI 6100 Daisy wheel £	350.00
MCP40 Col. Printer/Plotter	120.00
Accessories:	
Parallel Printer Lead	£10.00
Serial Printer Lead	£8.00
Epson Serial Interface 2K 8148	£60.00
Epson Serial Interface 8143	
NEC Serial Interface	
Epson Paper Roll Holder	£17.00
FX-80 Tractor Attachment	
PAPER Fanfold 2000 sheets	
Ribbon MX80/RX80/FX80	£6.50
Printer Sharer Parallel	
3 computers - 1 printer	€65.00
Gemini Delta 10 £	350.00
	C1110X29000
Cratead Craphics Tablet C	
Gratpad Graphics Tablet	1)
	1) 2195.00 2295.00 2299.00 420.00 230.00 230.00 260.00 106.00 £99.00 £6.50
COLOUR/GREEN MONITORS (leads incle Microvitec 143114" RGB Std Res. Microvitec 1431PS 14" RGB/PAL + Sound. 5 Microvitec 14451 14" RGB Med Res. Microvitec 1441 14" RGB Med Res. Microvitec 2031 20" RGB Std Res. Microvitec 2031 20" RGB Std Res. KAGA Vision II 12" RGB Med Res. KAGA Vision II 112" RGB Super Hi Res. KAGA Vision III 12" RGB Super Hi Res. KAGA Vision III 12" RGB Super Hi Res. KAGA 12" Green Hi Res. SANYO DMB112CX 12" Green Hi Res KAGA RGB Lead BNC Green Screen Monitor Lead BBC COMPATIBLE 5.25" DISC DRIVES:	1) 2195.00 2295.00 2299.00 420.00 230.00 230.00 260.00 106.00 £99.00 £6.50
COLOUR/GREEN MONITORS (leads incle Microvitec 143114" RGB Std Res	(1) 0.195.00 0.225.00 0.229.00 0.420.00 0.230.00 0.260.00 0.358.00 0.106.00 0.599.00 0.5358.00 0.5358.00 0.5358.00
COLOUR/GREEN MONITORS (leads incle Microvitec 143 114" RGB Std Res	(1) (1) (1) (1) (1) (1) (1) (1)
COLOUR/GREEN MONITORS (leads including convited 1431 14" RGB Std Res. Microvited 1431 PS 14" RGB/PAL + Sound .5 Microvited 1431 PS 14" RGB Med Res. Microvited 1441 14" RGB Med Res. Microvited 2031 20" RGB Std Res. KAGA Vision II 12" RGB Med Res. KAGA Vision II 112" RGB Med Res. KAGA Vision II II 12" RGB Super Hi Res. KAGA Vision III 12" RGB Super Hi Res. KAGA 12" Green Hi Res. SANYO DMB112CX 12" Green Hi Res. KAGA RGB Lead BNC Green Screen Monitor Lead BBC COMPATIBLE 5.25" DISC DRIVES: (All include cables, manual + format disc) 100K (40 Track)	1) 195.00 1225.00 1225.00 1225.00 1230.00 1260.00 106.00 106.00 106.00 106.00 106.00 106.00 106.00 106.00 106.00 106.00 106.00
COLOUR/GREEN MONITORS (leads incle Microvitec 143114" RGB Std Res. Microvitec 1431PS 14" RGB/PAL + Sound. Microvitec 1431PS 14" RGB Med Res. Microvitec 1441 14" RGB Med Res. Microvitec 2031 20" RGB Std Res. Microvitec 120" RGB Std Res. Microvitec 1431 12" RGB Med Res. Microvitec 1431 12" RGB Med Res. Microvitec 140" RGB Std Res. Microvitec 140" RGB Std Res. Microvitec 140" RGB Med Res. Microvitec 140" RGB Me	1) 195.00 1225.00 1225.00 1225.00 1230.00 1260.00 106.0
COLOUR/GREEN MONITORS (leads incle Microvitec 143 114" RGB Std Res	1) 195.00 229.00 229.00 420.00 230.00 230.00 230.00 230.00 250.00 106.00 599.00 505.50 140.00 140.00 140.00 165.00 17
COLOUR/GREEN MONITORS (leads including control of the control of t	(1) (1) (1) (1) (1) (2) (2) (2) (3) (4) (2) (4) (2) (4) (2) (4) (2) (4) (4) (4) (4) (4) (4) (4) (4
COLOUR/GREEN MONITORS (leads incle Microvitec 143114" RGB Std Res. Microvitec 1431PS 14" RGB/PAL + Sound. 5 Microvitec 1431PS 14" RGB Med Res. Microvitec 1441 14" RGB Med Res. Microvitec 2031 20" RGB Std Res. KAGA Vision II HI Res. KAGA Vision II HI Res. SAGA Vision III 12" RGB Super Hi Res. SAGA Vision III 12" RGB Super Hi Res. SANYO DMB112CX 12" Green Hi Res. SANYO DMB112CX 12" Green Hi Res. KAGA RGB Lead BNC Green Screen Monitor Lead BBC COMPATIBLE 5.25" DISC DRIVES: (All include cables, manual + format disc) 100K (40 Track) with psu. 200K (40 Track) with psu. 200K (40 Track) with psu. 200K (80 Track DS) 400K (80 Track DS)	(1) 1) 1) 1) 1) 1) 1) 1) 1) 1)
COLOUR/GREEN MONITORS (leads incle Microvitec 143 114" RGB Std Res	(1) 195.00 19
COLOUR/GREEN MONITORS (leads including control of the control of t	(1) (1) (1) (1) (1) (2) (2) (2) (3) (3) (4) (4) (4) (5) (6) (6) (7) (7) (8) (8) (9) (9) (1) (1) (1) (1) (1) (1) (1) (1
COLOUR/GREEN MONITORS (leads included incompleted 143114" RGB Std Res. Microvitec 14311PS 14" RGB/PAL + Sound .5. Microvitec 1431PS 14" RGB Med Res. Microvitec 1441 14" RGB Med Res. Microvitec 2031 20" RGB Std Res. KAGA Vision II HI Res. KAGA Vision II HI Res. SAGA Vision III 12" RGB Super Hi Res. SAGA Vision III 12" RGB Super Hi Res. SANYO DMB112CX 12" Green Hi Res. SANYO DMB112CX 12" Green Hi Res. MAGA 12" Green Hi Res. MAGA RGB Lead BNC Green Screen Monitor Lead. BBG COMPATIBLE 5.25" DISC DRIVES: (All include cables, manual + format disc) 100K (40 Track). SAGA With psu. SAGA WITACK) With psu. SAGA WITACK WITACK) With psu. SAGA WITACK	1) 195.01 195.01 195.01 1420.01 1420.01 1420.01 1230.01 1358.01 1599.01 165.01 175.0
COLOUR/GREEN MONITORS (leads including control of the control of t	1) 10 195.01 195

ALL PRICES EXCLUDE VAT. Please add carriage 50

GRAPHICS PLOTTER/WORKSTATION



Equally at home in the artists studio, hobbyists workshop, scienc laboratory, classroom, and production floor, this system has some thing to offer everyone. The 3-colour graphics plotter provides bot precision and versatility. The carriage can be moved with an accurac of 0.025 cm. over an A4 area — the plotter being able to accept pape and far thicker materials at sizes of up to A3. The basic colour plotte carries three colour pens each of which is software selectable.

Various add-ons greatly increase the versatility of the unit, while sti retaining the unit's accuracy. The servo controlled drill/router, and scriber enables drilling, cutting and scribing in various materials. Unique Opto Sensor (using a Hewlett Packard Device) turns the plotte into a high resolution scanning digitiser to read and store whole diagrams, for example, for use in map work. This unique versatile Workstation is supplied complete at £490. All items are available individually, with the basic plotter at £270.

TECHNOMATIC

Our in depth stocks allow us to offer immediate deliveries on most items and our aim is to provide the best available products at competitive prices. In addition to the items listed above we carry extensive stocks of: connectors, connector assemblies, components including TTLs, CMOS, RAMs, EPROMs and CPUs. Spares for the BBC computers are normally available from stock. Orders from government departments, public bodies, hospitals, schools, colleges, universities and recognised PLCs welcome. We specialise in world wide exports. No VAT on exports. Our specially negotiated freight charges to many countries ensure the customer considerable savings on charges.

Everything you need for your BBC Computer

Plus friendly service and professional advice

The state of the s	
Single Disc Cable	b00.83
Double Disc Cable	
DISCS/Pkt of 10 WABASH	3M
DISCS/PKI OF TO WADASH	
40T SS/SD£14.00	
40T DS/DD	£22.00c
80T SS/DD£24.00	
80T DS/DD	£30.00c
Life Time Warranty on 3M Discs	- COMPANY
3" Double Sided Disc E	ach C4 50c
FLOPPICLENE Drive Head Cleaning Kit	
Disc Library Case	£2.50d
Disc File Case 30/40	£8.00c
Disc Lockable Case 30/40	£15.00c
Disc Lockable Case 60/70	
EPROMS:	
Please phone for availability	
A STANDARD THE CONTRACTOR OF THE CONTRACTOR	
SOFTWARE:	
ACORN/MERLE BUSINESS SOFTWARE	
Invoicing, Stock Control, Accounts Payable,	
Accounts Receivable, Order Processing,	
Mailing System Ea	ch C22 65d
GEMINI Leisure - Full Range	un DEL OU
ACORNSOFT - Full Range	
ACOHNOUT I - Full Railge	
ACORN LANGUAGES including BCPL, LISF	
FORTH with Manuals	
BBCSOFT - Full Range	0-E-010-E-0
PROGRAM POWER - Full Range	
ACORNSOFT (Electron) - Full Range	
BEEBUGSOFT - Full Range	
Wordwise Spellcheck Disc	CICEDA
Design	
Superplot	£16.50d
Masterfile (Database)	£16.50d
Teletext Pack (Mode 7 Graphics)	£16.50d
The state of the s	
CASSETTE RECORDERS:	
SANYO DR 10 1 Data Recorder	£34.00b
Datex Slim Line	£24.00c
BBC Tage Recorder	
Cassette Lead	
HOBBIT Floppy Tape	
HOBBIT Zero Memory Option	
Computer Grade C-12 cassette	£0.500
Computer Grade Cassette 10 off	
Phillips Mini-data cassette	£3.00d
BOOKS (NO VAT) p&p £1.50/book	
100 Programs for the BBC	66.95
30 Hour Basic	
35 Educational Progs	
6502 Applications	
6502 Assembly Lang Programming	£12.95

STATE OF STREET		
6502 M/Code for Beginners	C5 95	-
6809 Assembly Lang Programming .	C12.05	AAA.
Advanced Prog Tech for BBC	C7 05	MA
Advanced 6502		5 Br
Advanced Hear Cuide	C12.05	7
Advanced User Guide	£12.90	-
Assembly Lang Pro on the BBC	F1.95	0700
Assembly Lang for the BBC		£7.95
Assembly Lang Prog for Electron		
Assembly Lang Programming		£8.95
Basic Prog on the BBC		
BBC Basic		
BBC Basic for Beginners		£6.95
BBC Micro for Beginners	115	£6.95
BBC Micro Compendium		£14.95
BBC Micro Disk Companion		
BBC Micro Expert Guide		66.95
BBC Micro Graphics & Sound		C6 95
BBC Micro in Education	St. Co. Lat.	C6 50
BBC Micro Revealed	777574	CE 00
BCPL User Manual	1 4 4 4 4 4	£15.00
Beyond Basic	CONTRACT	. £1.25
Creating Adventure Progs		£6.95
Creative Graphics	+ + + + +	E7.50
DIY Robotics & Sensors		£6.95
Discovering BBC M/Code		£6.95
Forth	C-2446	£7.50
Friendly Computer Book		£6.95
Graphics on the BBC Micro.		£6.95
Graphs & Charts		
Interfacing the 6502		£10.95
Intro BBC Micro	20,000,00	C5 95
Let YR BBC Teach U 2 Prog		£5.00
Making Music on the BBC Computer	12.030.00	C5 95
Micro Basic Sound Graphics		C7 05
MOS Memory Data Book		
Prog the BBC Micro		
Programming the 6502	101015	CO 05
Programming the 6809		
Programming the 6809	31314 5 414	£11.30
Programming the 8086/8088		£10.95
Programming the BBC		£6.50
Programming the Z80		
Start Prog with Electron		
Structured Programming		
The Computer Book		
The Electron Book	CONTRACT.	£7.95
TORCH Z80 Disc Pack Guide		£10.00
TTL Data Book Vol-1		. 29.00
TTL Data Book Vol-2		£5.20
User Guide	St. F. Tetal S.	£15.00
Using BBC Basic		
Using Floony Disks		66.95
Using the 6502 Assembly Lang	***	£14.50
Z80 Applications Book	1	C 10 95
200 Applications book.	A STREET	E 10.30
	SALES STREET	0.00

NEW LOW

unless indicated as follows: (a) £7 (b) £2.50 (c) £1.50 (d)£1.00

MONITORS:

PRICES MICROVITEC-a range of British Made DTI/ACORN approved Std/Med/Hi-resolution RGB colour monitors hat have a consistent, reliable performance. Also available in RGB/ PAL/SOUND versions. The KAGA range provides a similar performance in 12" screen format. Our Japanese manufactured Hi-Res green screen SANYO is an deal solution for high clarity 80 column text display. The KAGA green screen, with its 'chemically etched' anti-glare screen for the discerning user. All monitors are supplied with suitable leads at no extra charge.

BUZZBOX

This is a full specification, direct connect modem, with both Originate & Answer modes, allowing access to the many databases, bulletin boards, as well as inter-computer communication. The modem conforms to the international CCITT V21 300/300 Baud standard. (NOTE: Not suitable for PRESTEL). Having full BT Approval, it connects directly to the telephone line, for optimum performance. Being battery powered, it is totally portable (optional power supply available). £69. BBC Lead £3.50. External PSU £8.00

ACORNSOFT/MIRLE BUSINESS SOFTWARE

This long awaited range brings professional business software to the small business user at a budget price. Available on disc only, using genuine 'random access', each package can, if required, be linked together to provide a totally integrated business system. Modules comprise Invoicing, Order Processing, Stock Control, Accounts Receivable, Accounts Payable, Purchasing, Mailing System. Each package £22.65(d)

MAIL ORDERS TO: 17 Burnley Road, London NW10 1ED (Tel: 01-452 1500, 01-450 6597 Telex 922800) SHOPS AT: NW London: 15 Burnley Road, London NW10 1ED (Dollis Hill 2 mins walk, ample car parking space) West London: 305 Edgware Road, London W2. Tel: 01-723 0233 (Near Edgware Road →)

ACORN IEEE INTERFACE

A full implementation of the IEEE-488 standard, providing computer control of compatible scientific & technical equipment, at a lower price than other systems. Typical applications are in experimental work in academic and industrial laboratories. The interface can support a network of up to 14 other compatible devices, and would typically link several items of test equipment allowing them to run with the optimum of efficiency. The IEEE Filing System ROM is supplied. £282.

DISC DRIVES:

A full range of disc drives fitted with quality Japanese slimline mechanisms, (such as TEAC, MITSUBISHI etc.) are supplied ready to connect to your BBC, and come complete with necessary cables, formatting disc, manual etc. TEAC & MITSUBISHI mechanisms can operate in single and double density modes. The switchable disc drives give the user flexibility, by allowing access to both 40 & 80 Track discs. The 40/80 Track switching module can be simply attached to your standard 80 track drives thereby vastly increasing their versatility. We have a full range of diskettes, variety of disc cases, disc-drive cables. The Floppiclene storage

cleaning kit, is the ideal way to ensure optimum performance of your drives. The use of disposable cleaning discs eliminate the risk of recontamination and abrasion, and ensure continuous data capture and transmission.



KENDA DMFS

A truly professional double density DMFS with several unique features:- *requires no RAM i.e. PAGE=&EOO *uses standard CP/M filenames & disc drive conventions *no limit to number of files "single/double density automatically selected "runs most 'protected' software *enables 80 Track drives to read 40 Track discs.

SCOTCH 3M FLOPPY DISCS

We now stock the high performance yet economical 3M range. Due to advanced production techniques, a higher standard has now enabling Scotch to guarantee error performance for life.

3" HITACHI DISC DRIVES

The latest in minature data-storage technology. Totally hardware & software compatable with 51/4" drives (can be used together!). Supplied complete with format disc, manual, cables etc. £160(b).

ULTRACALC

With advanced features, such as: "Handling of labels as well as numbers, as values, allowing the search of a list by a meaningful name, instead of just a number. *Efficient memory usage allowing large spreadsheets to be constructed. *Variable width columns. Facilities include SUM, Replicate & most mathematical functions. It helps you to create and manipulate *Budgets *Cash-Flow forecasts *Price Lists *Balance Sheets *Time Sheets *Order Entry *Small Databases *Scientific Calculations etc. £65.

Continued on page 57 =

INSTITUTIONS & EDUCATIONAL ESTABLISHMENTS

Our bulk purchasing power enables us to provide very competitive quotations, as well as being able to supply in quantity, a very wide range of equipment, accessories and spare parts from stock.

ECHNOMATIC

All prices exclude carriage & VAT. Please add carriage as indicated and add 15% VAT to the total order value. For fast delivery telephone your order quoting VISA or Access card or official order number.

(Minimum telephone order £5).

Electronequip

(Authorised BBC Dealer, and service centre)

SOFTWARE

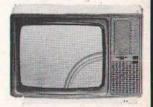
(A few examples from our range of 1,000 + titles)

		VAT	Inc. VAT
BCAFCHIC	A & F Software Chuckie Egg	6.87	7.90
BCAKMUNG	ASK Number Gulper (XRB13)	8.65	9.95
BCALBUGB	Alligata Software Bug Blaster	6.91	7.95
BCALLUNA	Alligata Software Lunar Rescue (8007)	6.91	7.95
BCAMCALC	Ampalsoft Cheshire Cat Calculus O level	6.04	6.95
BCAS100P	Acornsoft 100 Programs for BBC Micro	10.00	11.50
BCASAVIA	Acornsoft Aviator flight simulator SBG02	13.00	14.95
BCASJCBD	Acomsoft JCB Digger (SBG09)	8.65	9.95
BCBETIM1	BES Timeman One (XBEO5)		8.97
BCBSWHIT	BBCseft White Knight Mark Eleven (B)	10.00	11.50
BCFBSTFO	First Byte Star-Force Lander		6.95
BCGACHEE			12.95
	Garland Software Chemical Equatons	17.26	
BCGEBEEB	Gemini Beebcalc (Spreadsheet)		19.95
BCGEBEEP	Gemini Beebplot (Graph Plot)		19.95
BCGGNUMB	Griffin & George Numberlun Good Houseko's Mr T's Alphabet	8.65	9.95
BCGHTALP	Good Houseke's Mr T's Alphabet	11.26	12.95
BCGRORBI	Graph Research Orbit 0	8.65	9.95
BCHIFIRE	Highlight Software Firefight		7.50
BCHOBEGA	Honeyfold Beginners Assembly Language	14.24	14.95
BCHSPENG	H. Soft Penguin		8.91
BCIBDATI	Ivan Berg Dating Game (XBX08)		12.65
BCIJATLA	LJK Atlantis for BBC (14)	5.65	6.50
BCJOYSTI	IJK Atlantis for BBC (14) Joystick Utility program for BBC	6.96	6.84
BCKAGALA	Kansas Galactic Firebird		9.49
BCKAPINB	Kansas Pinhall Arcade		9.49
BCKDPASS	Kay Dee Software Pass Go		9.78
BCKOFREB	Kosmos Software French Mistress B	8.65	9.95
BCKOGERA	Kosmos Software German Master A	8.65	9.95
BCL9SNOW	Kosmos software German Waster A	0.00	
	Level 9 Snowball (B)	10.00	9.90
всминовв	Melbourne House Hobbit		14.95
BCMRGRST	Micrex Grafstik drawing package	6.91	7.95
BCMSFIRS	Mirrorsoft First Steps with the Mr. Men	7.78	8.95
BCPPGHOU	Program Power Ghouls	6.91	7.95
BCPPINTE	Program Power Intergalactic Trader (B)		8.95
BCPPMAZE	Program Power Maze Invaders (B)	5.17	5.95
BCPPSPAC	Program Power Space Jailer (B)	6.04	6.95
BCPSVUCA	Psion VU Calc	13.00	14.95
BCOSBEEB	Quicksilva Beeh Art (B)	13.00	14.95
BCOSMUSI	Quicksliva Music Processor (B)	13.00	14.95
BCRHSKIS	Quicksliva Music Processor (B) RH Software Ski Slalom (RHS002C)	7.78	8.95
BCSHGBLT	Simon W. Hessel GB Ltd	6.04	6.95
BCSIATTA	Software Invasion Attack on Alphacenturi		7.95
BCSIEAGL	Software Invasion Eagles Wing (B)		7.95
BCSIGUNS	Software Invasion Cagles Wing (b)		7.95
BCSMDIS	Simonsoft Disassembler		7.95
BCSSCENT	Superior Software Centipede		7.95
BCSSCRAZ	Superior Software Crazy Painter	6.91	7.95
BCSTDRAU	Stack Lightpen Software Draughts (B)		5.75
BCSUGRAS	Sulis Software Grammar Tree Sentences		9.95
BCSUWORD	Sulis Software Wordpower	8.65	9.95
BCVMDELT	Voltmace Delta Driver Cassette Aconsolt/Mirle Accounts Payable (SNB13)	5.17	5.95
BDASACCP	Acomsoft/Mirle Accounts Payable (SNB13)	21.70	24.95
BDBBMAST	Beebugsoft Masterfile (40T)	16.50	18.98
BDBBVIEW	Beebugsoft View Spellcheck (40T)	16.50	18.98
BOCLKEY	Clares (The) Key (Format & Backup)	11.26	12.95
BOCLEEPL	Clares Replica (8/10 programs to 1 disc)	10.43	11.99
BOCYFAYR	CYB Design Services Payroll	43.43	49.94
BDEDWORD	Clwyd Technics Edward User (ROM + Disc)	51.95	59.74
BDELUT18	Flactennaguin RRC Utility 1 format (201)	8.65	9.95
BDELVIF4	Electronequip BBC Utility 1 format (80T) Electronequip VIEW Printer Drivers (40T)	12.00	13.80
BDELVIP8	Electronequip VIEW Printer Drivers (401)	12.00	13.80
BOHSLETB	Distribut Column Latterbase	7.00	8.99
	Highlight Software Letterbugs		
BDVMCEL8	Voltmace Delta Joystick Driver Disc 80T	1.12	8.95

PRINTERS

	PHINIERS	
Printer Interfa	ices Ex VAT	Inc. VAT
PIEPPB08	Epson Printer Buffer/Spooler 8K Parallel 75.00	86.25
PIEPPB16	Epson Printer Buffer/Spooler 16K Parallel	97.75
PIEPPB32	Epson Printer Buffer/Spooler 32K Parallel	120.75
PIEPPB64	Epson Printer Buffer/Spooler 64K Parallel 145.00	166.75
Printer	State of Management and American Control of the Con	2000
PTBHR15	Brother HR-15 13cps Daisy Wheel Printer	458.85
PTCP80	CP-80 80cps Printer (MX-80 type III)	228.85
PTDS2000	Daisy Step 2000 Daisy Wheel Printer 20ce 299.00	343.85
PTFX100	Epson FX100 160cps (16" Dot matrix printer)	592.25
PTFX80	Epson FX80 160cps Printer	458.85
PTINTEGE	Integrex Colour Jet Printer 37cps 489.00	562.35
PTJ6100	Juki 6100 Daisy Wheel Printer 18cps 390.00	448.50
PTJP101	BBC Spark-Jet Printer 299.00	343.85
PTKP810	Kaga/Taxan KP810 140cps (Letter Quality)	343.85
PTKP910	Kaga/Texan KP910 140cps LO Printer 17"	458.85
PTMCP40	MCP-40 Printer/Plotter (4 Colours)	129.95
PTMX100	Epson MX100 Type 3 Printer 445.00	511.75
PTMX80	Epson MX-80F/T 80cps Dot matrix printer	343.85
PTRX100	Epson RX-100F/T Printer 100cps Frict/Tr	471.50
PTRX80	Epson RX-80 Printer 100cps	297.85
PTRX80FT	Epson RX-80F/T Printer 100cps (Frict/Tr)	320.85
PTSDEL10	Star Delta-10 160cps Printer (8K buffer)	398.75
PTSDP510	Star DP510 100cps 2k Buffer Frict/Tracto	332.35
PTSDP515	Star DP515 100cps 15" Printer (MX-100)	458.85
PTSGE10X	Star Gemini-10X 120cps Printer	251.85
PTT1040	TEC F10-40 40cps Daisy Wheel Printer	1477.75
PTT1055	TEC F10-55 55cps Daisy Wheel Printer	1926.25
PTT15002	TEC 1500-25 Daisy Wheel Printer 25cps	688.85
PTTCOLR	Torch Colour Printer	1782.50

NORDMENDE



14" TV/Monitor £213.00 + VAT

Monitors	Ex. VAT	Inc. V
MNB12E	BMC 12F Green Monitor 18MHz 99.00	113
MNCE370A	Cable CE 370A Colour RBG Monitor	194
MNK12A	Kaga/Taxan K12A 12" Orange Monitor	129
MNK12G	Kaga/Taxan K12G 12" Green Monitor 99.00	113
MNKVIS1	Kaga/Taxan Vision I RGB Mon. (Low Res.) 199.00	228
MNKVIS2	Kaga/Taxan Vision II RGB Mon. (Medium) 285.00	327
MNKVIS3	Kaga/Taxan Vision III RGB Mon. (Hi Res.) 399.00	458
MNKX1201	Kaga/Taxan KX12016 12" Green Monitor P31 99.00	113
MNKX1202	Kaga/Taxan KX1202G 12" Green Monitor P39	129
MNKX1203	Kaga/Taxan KX1203A 12" Amber Monitor	129
MNM1431	Microvitec 1431 14" Colour Monitor (BBC)	228
MNM1431A	Microvitec 1431 14" PAL/Audio Col. Mon	258
MNM1431Z	Microvitec 1431/MZ RBG/Composite Monitor 225.00	258
MNM1441	Microvitec 1441 High Res 14" BBC Monitor	506
MNM1451	Microvitec 1451 Medium Res 14" BBC Monitor 299.00	343
MNN1534	Nordmende 14" TV/Monitor	244
MNN3534	Nordmende 14" TV/Monitor with remote con. 234.00	269
MNN3536	Nordmende 16" TV/Monitor with remote con	356
MNN4430	Nordmende 20" Prestige TV/Monitor remote con	479
MNN4432	Nordmende 22" Prestige TV/Monitor remote con	526
MNN4437	Nordmende 27" Prestige TV/Monitor remote con	588
MNSM12M	Sanyo SM12N Green Monitor 15MHz	90



Disc Drives	Ex.VAT	Inc. V
DDANDO1	BBC 100K Single Disc Orive (ANDO1) 217.50	250.
DDAND02	BBC 800K Dual Disc Drive (ANDO2) 607.83	699.
DDCASE	Disc Drive Case for 5.25" 1/2 height dr	7.
DDCD200	Cumana 200K dual disc drive 40T 305.00	350
DDCD400	Cumana 400K dual disc drive 80T 386.00	443.
DDCD400S		539.
DDCD800	Cumana 800K dual disc drive 80T	495.
DDCD800S		573.
DDCDX200	Cumana 200K dual disc drive 40T No PSU 298.00	342
DDCDX400		443.
DDCOX800	Cumana 800K dual disc drive 80T no PSU	494.
DDCS100	Cumana 100K single disc drive 40T	194.
DDCS200	Cumana 200K simple disc drive 80T 209.00	240
DDCS400	Cumana 400K single disc drive 80T 233.00	267.
DDCSX100	Cumana 100K single disc drive 40T No PSU 149.00	171.
DDCSX200	Cumana 200K single disc drive 80T No PSU	221
DDCSX400	Cumana 400K single disc drive 80T No PSU	247

TORCH COMPUTERS Perfectly Made in Britain

	Perfectly Made in Britain	
Torch Compu		Inc
TC301	Torch Work Station (No monitor) (301) 1244.00	143
TC303	Torch Work Station with TOSCA (No mon.) 1449.00	166
TC350	Torch Computer twin 400K (new style)	258
TC353	Torch Computer twin 400K & TOSCA (grey)	282
TC68000	Torch Computer Twin 400K Floppy + 68000	408
TC68020	Torch Computer 20Mb Hard Disc + 68000 5900.00	678
TC725	Torch Computer 20MB, twin 400K + 68000	649
TC725U	Torch Computer 20Mb, 2x400K, 68000 + Unix 6050.00	695
TCCNET	Torch C NET Upgrade from CPN to MCP 85.00	9
TCF500	Torch Computer twin floppies (CF500)	339
TCFS500	Torch Computer twin 400K & TOSCA CFS500 3150 00	362
TCH520	Torch Computer 20Mb Winchester CH520	649
TCHDR68K	Torch 20Mb, 400K Floppy, Z80 & 68000	286
TCHDPZ80	Torch 20Mb Hard disc, 400K Floppy + Z80	263
TCHS520	Torch Computer 20Mb Hard Disc & TOSCA 5850.00	672
TCMC240		66
TCUNICOR	Torch Colour Monitor MC240 for 301 & 303	332
TCZ80SP	Torch Z80 Second Processor (ZEP100) . 375.00	43
TOZ800P	Torch Z80 Disc Pack (800K Dual + Z80)	79



Electronequip

Kings Lynn Brand Tel: 0553 3782

BBC

36-38 West Street, Fareham, Hants (0329) 230670

Electronequip

(Authorised BBC Dealer, and service centre)

NEW EXTENDED TEL. ORDER SERVICE

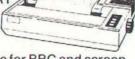
6 sales lines manned to 10.00pm Monday to Friday

* SPECIAL OFFERS Mail order only

*EPSON

RX-80FT £245.52 + VAT

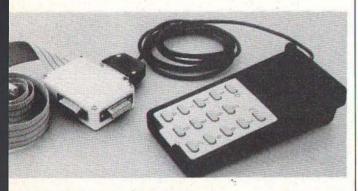
FX-80 \$365 09 + VAT



Printer price includes cable for BBC and screen dump rom is available for £7.50

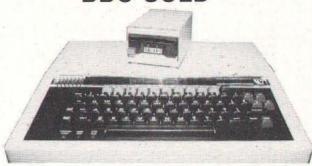
VOLTMACE DELTA 14B

*10% off listed prices



> TRADE ENQUIRIES WELCOME Access & Barclaycard Accepted Large Stocks - 24 Hour Despatch Carriage 50p

2 FREE ACORNSOFT **GAMES WITH EVERY** BBC SOLD *



Electroneguip is an authorised Acorn service centre and has been an Acorn dealer since the introduction of the Atom. Our demonstration facilities include 20 station Econet and Torchnet systems.

D.C	DDC M:	E. WAT	IVAT
Ref.	BBC Micros	Ex VAT	Inc VAT
ANB01	BBC Model B Micro Computer	348.26	399.00
ANB02	BBC Model B with Econet Interface	389.14	446.00
ANB03	BBC Model B with Disc Interface	426.59	489.00
ANB04	BBC Model B with Disc & Econet Interface	467.45	536.00

3" Micro Disc £129.95 (inc. VAT)

Disc Interface & £198.95 (inc. VAT)



Micro Disc Drive for the BBC Micro

The Micro disc drive offers a method of low cost quick access to programs. The drive is essentially a small version of a 51" disc drive and offers similar features to the larger drive. The data is stored on a 3" disc, this is enclosed in a protective hard plastic cassette which features a write protect switch.
The micro drive requires the standard Acorn disc interface, but a new disc filing system rom. Acorn DFS may be exchanged for the micro DFS for £12.00. The new micro disc filing system can read and write to Acorn DFS discs.

Thus if a 51 inch and a micro floppy were connected on the same cable files could be transferred between them.

Capacity: 80.64 K bytes Transfer Rate: 125k bit/s.

BRANCHES

FAREHAM: 59 WEST STREET (0329) 230670 KINGS LYNN: 17 TENNYSON AVE. (0553) 3782

MAIL ORDER: 36-38 WEST STREET FAREHAM, HANTS. (0329) 230670

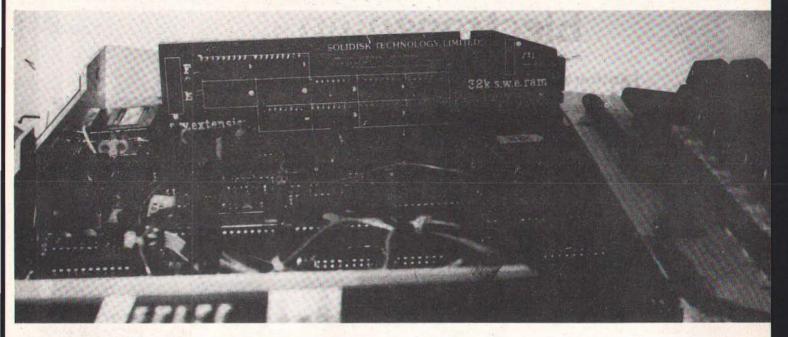


Electronequi

36-38 West Street, Fareham, Hants (0329) 230670



EXTREMELY POWERFUL — HANDLE WITH CARE



SOLIDISK SIDEWAYS RAM

Solidisk Sideways RAM is the most exciting add-on that many have been waiting for Acorn to produce! Sideways RAM systems have been described in detail in ECM, Acorn User, BBC Micro User etc., and become de facto the way to upgrade the BBC computer. Solidisk Sideways RAM is the first, most popular and most powerful implementation on the BBC computer.

Don't be deceived by salesman's gimmicky talk such as 'the Model C', the '52 k BBC computer' or 'the more you pay, the more you get'. Ask questions and find out the facts and figures.

Compare products — and then decide.

HOW EASY TO INSTALL?

Installing the Sideways RAM on your BBC micro is quite straightforward: push the base unit into the rightmost sideways socket, plug in the control wire terminals and the sideways RAM board into the base unit (see pictures). Insert the utility disc and press the SHIFT-BREAK keys...

HOW ABOUT COMPATIBILITY?

The Sideways RAM is completely compatible with all issues of BBC computers, disks, all sideways ROMs, the tube and second processors. Torch disk pack, Teletext, Econet etc. but NOT with ROM extension boards, since it can replace them.

Its power consumption is so low that you can use it in conjunction with twin disks.

HOW DOES IT WORK?

Occupying the same place as sideways ROMs (such as BASIC, WORDWISE, DISC DOCTOR), it is treated like other Sideways ROMs and therefore can replace them. It is ideal for developing ROM-able application programs and eventually it enables ROM based software to be sold unchanged on tape, disk or by electronic mail.

Unlike the Aries B20 board, the Machine Operating System communicates with Sideways RAMs as naturally as with Basic, without complicated procedures such as unknown *FX calls or the need adhere to new programming rules. With Sideways RAM, you can SAVE, LOAD and RUN. You can also write programs in ANY language, using any filing system.

HOW ABOUT SOFTWARE?

Solidisk Sideways RAMs have a much larger range of uses than any other system and the software support is free. Take a look on some of the programs supplied:

MULTITASKING DISK FILING SYSTEM.

By adding extra facilities to the present Acorn's DFS, it is now possible to run more than one program at a time. Furthermore, we are aiming at beating Sinclair's QDOS in the near future.

RAM FILING SYSTEM:

Strikingly similar to disk filing systems but can be used with tape, programs and data can be directly put in ROM form thus enabling stand alone applications to be implemented economically. The ROMs made with STL-RFS is also Electron compatible. (See EPROM products for more details)

PRINTER SPOOLER:

Printer output can also be directed to Sideways RAM and printing will carry on in the background while your computer is busy processing.

RAM-DISC:

The Solidisk is a RAM disc in your system. It works EXACTLY like an extra disc drive but a lot faster as it has no inertia. Capable of loading or saving at 40,000 bytes a second, it is responsible for the outstanding performance of SILEXICON and WORD64 (see opposite page).

The Solidisk resides entirely in Sideways RAM and does not use any bytes of the normal RAM. The Solidisk is a marvellous productivity tool in every application field: compilers, data base, 3D graphic, Wordprocessing, Engineering, CAD, Music and speech synthesis etc.

HOW ABOUT THE FUTURE?

Also unlike other makes (SIR, APTL, WE Sideways ROM/RAM extension boards and the Aries B20), Solidisk Sideways RAM is expandable from 16k right to 128 k and to 256k in July. It is a fraction of their cost thanks to Texas Instruments and INMOS advanced VLSI technologies.

That awesome power is the reason why you should handle it with care.

Solidisk sideways RAM has created a rapidly growing user group and we are working flat out to step up production for the dealers.

HOW EASY TO INSTALL:



Push in the base unit



Connect the control wires

WHICH SIDEWAYS RAM DO YOU NEED?

olidisk Sideways RAM is available in 16k (SWR16), equivalent to 1 sideways ROM, 32k SWR32), equivalent to 2 sideways ROMs or 128k (Solidisk), equivalent to 8 sideways OMs. You can buy a small Sideways RAM now and upgrade it later. From the SWR16 to the WR32 is by straight exchange, from the SWR32 to the Solidisk is by adding the Solidisk xtension which holds 96K of memory on just 3 square inches!

REE SOLIDISK SOFTWARE SOFTWARE SUPPORT SERVICE: WORDPROCESSING:

Ising the Solidisk as working space for WORDWISE, WORD64 offers up to 64K free haracters for any text

Ising WORD64, you can write much larger programs than BASIC normally handles!

ILEXICON:

ILEXICON scans texts at more than a 1,000 words a minute and comparing each word gainst the dictionary, Silexicon marks the mis-spelt words for either addition to the ictionary or eventual correction.

disk based program would make a lot of noise accessing the dictionary, SILEXICON takes dvantage of the non inertia of Sideways RAM and runs quietly at more than 20 times the peed. Silexicon works with the Solidisk or a second disk drive.

N DISK FILING SYSTEM:

TL150: this utility program enhances Acorn DFS.90 by moving disk working space into ideways RAM leaving PAGE at &EOO and adding extra disk commands. With STL150, you an format 40/80 track dikettes, verify and have up to 150 directory entries per side. Many FSs have similar features (such as WATFORD DFS) but none has as much as STL150.

N PORTABLE APPLICATIONS: OLIDISK RFS

olidisk RFS (RAM/ROM filing system) is an innovation. Save and load your program, open file for BPUT, BGET directly in Sideways RAM at 60,000 bytes a second. More: the STL RFS as a Sideways ROM format, it can be copied onto EPROM to give instant recall of your rograms. Plug this EPROM into any sideways socket, type * RFS and it runs itself. Imagine he profit in selling your program in EPROM!. Compatible with the ELECTRON and BBC, ape and disks, SWR16, SWR32 and Solidisk.

N SYSTEM MANAGEMENT:

THE MENU PROGRAM

This program puts all computer's resources at your fingertips helps to set up your firmware, lisks etc by simple menu options.

MORE FREE SIDEWAYS RAM SOFTWARE TO COME:

While others are making promises for software to be written, Solidisk Sideways RAM comes with a complete, novel and powerful software package including compatibility with existing sideways software. Right now, the STL RFS has the same effect on the BBC omputer that the DFS had 2 years ago — that means masses of low cost software on the ine!

ach Sideways RAM is accompanied by the Sideways RAM User Manual, full 1 year warranty, a utility disc containing 100k of programs and free mailing on all new publications rom the Software Support Service.

Available soon: the Source Code and Technical Manual (3 floppies and a 300+ page book) price = £10, the SILEXICON EXTENSION PACKAGE (3 floppies and a 40 page manual, 80,000 word dictionary: English and French now, German and Spanish planned) price = 9.00. '4S' also publishes regular updated SWR utility discs at £3.00. Every user can do contract work for the SUPPORT SERVICE and make a lot of money for him/herself! n other words, the Solidisk Sideways RAM is not only a wide choise now by saving you noney but also a long term INVESTMENT.

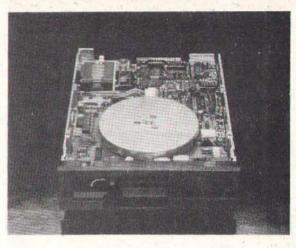
EPROM AND OTHER PRODUCTS FROM SOLIDISK:

You can also purchase a growing range of add-ons designed to be used in the same base unit such as EPROM programmer now, Teletext receiver and 8088 second processor later. We also product disk systems based on the TEAC FD55 series. A detachable keyboard case and portable CPU case for the BBC computer is well under way for delivery in JUNE. We also have the whole range of SANYO colour monitors, EPSON printers and VERBATIM dikettes at very competitive prices. Please ring us for a quotation.

HOW TO ORDER?

To order the Sideways RAM is simple: complete the coupon below. Access and Barclay card holders can place their order by phone on Southend (0702) 334766/334777. Large organisations, dealers and OEMs can obtain quantity discounts. Please ring for quotations (0702) 354675.

Administrative and brief technical enquiries: (0702) 354674.



Prices include:

- case cable
- manua 2 year warranty

UVIPAC EPROM ERASER



ORDER FORM:

THE BBC SIDEWAYS RAM:

SWR16 .	 **					*		 	(0)	 . 4			· (6	**	 00.0		£41	65	
SWR32 .																	£57.		
SOLIDISK		 	i	 À			è		2				6			 £	149	95	

TEAC DISK DRIVES:

FD55A £139.95 40 tracks/ Single Sided, cased, complete with Cables, Manual,
Demo disk and 2 year warranty
FD55F £229.95 Double Sided 80 tracks per Side, cased, with cables, manual and 2
year warranty VERBATIM DISKETTES:
SS/SD 40 or 80 trks box of 10£16.00
DS/SD 40 or 80 trls box of 10
EPSON-SANYO POA

EPROM PRODUCTS:

EPROM PROGRAMMER£15.00
UVIPAC ERASER
2764 by 5£35.00
SWR UTILITY DISC (MONTHLY UPDATES)
SOURCE CODE AND TECHNICAL MANUAL £10.00
SILEXICON EXTENSION PACKAGE£9.00
Post and packing:

Small items	6				ä		i,	,		è			i.	.,									÷	÷		 				
Disk drives																					2					0			1	
Printer/Moni	tor		,		×					¥	ú.									6	i		4	è	è		ò	. +		*
SOLIDISK	TE	C	H	11	N	O	ı	.(0	C	3	Y	ı	.1	٨	Л	ľ	T	E	E)									

17 Sweyne Avenue SOUTHEND ON SEA ESSEX

Tel. Southend (0702) 354 674/5 334766/334777 Solidisk products are also distributed in the following countries: France: RUN INFORMATIQUE-PARIS, Holland: ECD-Delft, Germany: VOBIS and KINGSOFT-Aachen, Sweden: DIGILOG-Goteborg.

June 1984 MICRO USER 13

£3.00

£8.00

DISC DRIVES PRING

ASEDATA

UNIQUE FACILILTY: Only CHASE DATA utilise the two colour LED on the Canon 221 disc drive to show track mode selected and ready status:

40 track mode

80 track mode

Power on

Selected drive

: LED Green

: LED Red

: Half-illumination (red or green)

: Full-illumination (red or green)

1YEAR WARRANTY **ALL PARTS** & LABOUR

110/210 DUAL DRIVESYSTEM

CHASE DATA LTD are pleased to annouce the launch of the latest generation of Canon disc drives - the ultra slim model 221 (double sided 80 track) - TRULY SUPERB VALUE FOR MONEY

All inclusive means Disc drive + case + all power and data cables + U.K. carriage + utilities disc & manual + V.A.T.

Quality product The Model 221 is available with its own custom-built secondary switching power supply. Safe, low in heat generation and outstanding value at £25 (inc. VAT)

Full service support Our units come with a full 1 year warranty on parts & labour. Disc drive service is via the leading U.K. Independent Drive Service Company.

EPROMS 2764-250 nS £5.75p each.

Send remittance (Cheque only please) with your order to:

P.O. Box 6, Woking, Surrey GU214PB. (Tel: 0784 38487).

All inclusive price list

MODEL 110 210 221 **FORMATTED** CAPACITY OF SINGLE DRIVE ON BBC MICRO 200K 400K 100K **SINGLE DRIVE** IN CABINET £170 £198 £236 **DUAL DRIVE** £320 IN CABINET £370

All units available with on-board power supply. Additional cost: £25.

mw systems Offer You

A FULL RANGE OF FLOPPY DISC SYSTEMS FOR THE BBC MICRO

- **Disc Drive Units** are cased in high quality steel boxes, finished in a matching BBC colour.
- **All Units** come complete with manual, formatting disc and appropriate cables.
- Optional Power supply available for Dual 400K.
- All Single Units can be upgraded to a double unit.
- All Equipment is covered by a full 1 year warranty.



MWS 800K (1.6MB) at Double Density. DUAL DRIVES from Toshiba. These drives are double sided/double density and are 40/80 Track Switchable.



This drive is double sided/single density.



MWS 400K (800K at Double Density). SINGLE DRIVE from TOSHIBA. This drive is also double sided/double density and is 40/80 Track Switchable.

MW SYSTEMS NOW HAVE THE FOLLOWING DISTRIBUTORS IN THE U.K.

England, Wales, N. Ireland & Eire.

160 Retail outlets. Ring C.K. SUPPLIES for your nearest dealer.

Scotland:

Branches in Edinburgh and Glasgow. Aberdeen opening soon.

Channel Islands:

C.K. SUPPLIES

Unit 5, Norside, Oldmixon Crescent, Weston-Super-Mare. Tel: 0934-418838

MICROWORLD

(Andrew Whyte & Son Ltd) 12 Leven Street, Edinburgh EH3 9LG. Tel: 031-228 1111

Berry's Office & Computer Supplies Ltd.

Charroterie Mills, St. Peter Port, Guernsey, C.I. Tel: 0481-28797

Access and Barclaycard accepted.

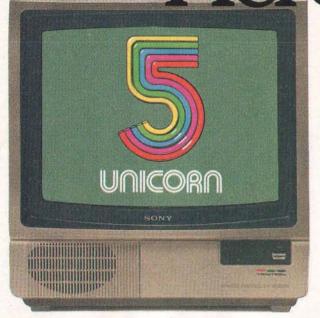
All Government and Educational enquiries in England & Wales:

Ring MW Systems 0494-450341 or write to:-MW Systems (Education Dept.), Matrix House, Lincoln Road, Cressex Industrial Est., High Wycombe, Bucks.





Unicorn.Fivenew Here's the ful





The new UNICORN range from TORCH Computers gives the enthusiast and professional user a choice of upgrades which takes the BBC Model B Micro to the ultimate height of performance.

The result of TORCH'S total commitment to the BBC Micro is the only complete range of high performance hardware available. Offering every BBC Micro owner five new upgrade channels, UNICORN will transform your BBC into a fully communicating workstation, a CP/M® compatible business machine or the ultimate in high powered 32-bit data processing.

At the top of the range, THE UNICORN. offers the power and sophistication of System III UNIX® whilst other channels make available the flexibility of languages such as FORTRAN, PASCAL, BCPL and COBOL. All models, with the exception of the HDP240, provide BBCBASIC(Z80) on the Z80 rather than the Model B's 6502.

Tune in to the Channel that most suits your requirements. Whichever level you choose you can be sure of a system with infinitely expandable potential for a confident future in the world of computing.



- Z80 Extension Processor
- 4MHz Z80A
- 64K RAM

• 24K ROM

The object of any upgrade kit is to improve processing ability and to increase data storage capacity. The UNICORN ZEP100 is the first stage upgrade

which opens channels into the world of serious computing. The ZEP100 is the

roven 8 bit second processor for the BBC Model B micro. A Z80 extension processor which enables the use of the well established CPN operating system, giving access to the vast range of applications programs and languages available for all CP/M® micros. When fitted to a BBC model B microcomputer with compatible high quality disc drives it provides a complete business or scientific computer which can run large applications programs or use advanced languages, with the ability to switch back to standard BBC programs at any time. Any ZEP100 can be linked, via

the Econet® option on the BBC, to a network of other TORCH computers to

provide a workstation running on TORCHNET. Full TORCHNET operating sys-tems software is provided to

allow access to information anywhere on the network, or to communicate with other computers.

The 64K ZEP100 is supplied with full software support including word processing, spreadsheet, database and

utilities. The ZEP100-around \$299 (ex. VAT).



diskettes



Perfect Filer

nannels for the BBC. ogramme.



The ZDP 240 4MHz Z80A ● 64K RAM 24K ROM Twin, double sided 400K floppy discs Independent integral power supply



unning TORCH's own CP/M® comatible operating system based in ROM. This advanced design means hat almost all of the 64K RAM pro-ided by the Z80 board is available for P/M® programming use—an dvantage no other BBC micro apgrade can offer.

If your BBC micro has the conet® option, there is a further benefit the ZDP240 can offer. ORCHNET can link together up to 254 upgraded Model B's on a local rea network, so for enthusiasts, Clubs and Schools it is a simple and ow-cost way to achieve networking

The discs can be used for storage under the Acorn DFS system or for CP/M® programs and data.

A comprehensive software package is provided with the disc pack. It ncludes word and data processing and a spreadsheet program, along with utility programs and manuals. The TORCH Z80 Disc pack is

recommended by the CCTA for government use. The ZDP 240around £699 (ex.VAT).



The HDP 240

- 20Mbyte hard disc Winchester
 Double sided 400K floppy disc
- Integral power supply

For users who need much more storage capacity than is available on floppy discs and who require the large speed gains that a Winchester hard disc provides, the third new channel is now available. The UNICORN HDP240 combines a 400K floppy disc drive with a 20Mb hard disc and its associated controller. The pack connects directly to the disc and IMHz bus sockets on the BBC Model B.

In conjunction with a ZEP100, it provides a powerful business computer for running CP/M programs with large amounts of data. The floppy disc can be used for storage with the Acorn DFS system, and both discs can be used by other TORCH systems on the TORCHNET local area network. The HDP240-around £1995 (ex.VAT).



The HDP68K

- 8MHz MC68000 6MHz Z80B

- 256K RAM (68000)
 64K RAM (280)
 20 Mbyte hard disc Winchester
 Double sided 400K floppy disc

Integral power supply

The fourth channel in the UNICORN range is for users who need the extra processing power of a 68000 32 bit processor, as well as the 280 running standard software. The UNICORN HDP68K provides the ultimate in performance, offering an extra 256K RAM and a 68000 processor running at 8 million cycles per second. It also contains a Z80 processor to allow the running of

existing TORCH software. The HDP68K-around \$2495 (ex.VAT).



The Unicorn Spec. as HDP68K PLUS UNIX® operating system.

UNIX® System III is the UNIX System in its the recognised operating system of the '80's. A very powerful and sophisticated multi-tasking system, it includes a vast library of utility programmes.

The fifth channel and top of the range, THE UNICORN, puts UNIX THE UNIX TH

within reach of the individual user, at a price unmatched by any other UNIX® systems, by combining the reliability of the BBC micro with advanced technology from TORCH Computers

TORCH UNIX operates under the network operating system. Using UNICORN products, a low-cost network of BBC Micros can be configured to offer the most complete range of educational computing facilities available anywhere.

Other facilities available include UCSDp-System, LISP, FORTH, PILOT and PROLOG. The UNICORN – around £2895 (ex.VAT).



Open channels for the BBC micro.

To: Torch Computers Ltd., Abberley House, Great Shelford, Cambridge CB2 5LQ. Telephone: Cambridge (0223) 841000.

Please send further information on the UNICORN range plus your FREE 1984 Software Catalogue.

Name

Address



TORCH

mark of Digital Research In Econet is a registered trademark of Acorn Computers Ltd. x is a registered trademark of Bell Telephone Laboratories

UK version Model B necessary Disc interfaces are necessary for use with the Unicorn range.

Text and Graphics provided by BBC Model B. Keyboard provided by BBC Model B.

More Programs.. m

Genous Software NewImproved Database

This new memory based database from Gemini, which uses machine code to optimise the memory available and improve processing speed, includes the following features:

Records are presented as a completely user-definable card on the screen, with up to 15 fields of data. Main routines provide the facility to add, modify or delete records, to sort the entire file by any record, and comprehensive searches may be peformed using combinations of any fields. Results of searches may be screened or printed as a summary of up to six fields, or as complete records. Calculations allow field contents to be derived from a number of other fields, which may be used for example, to give total, average etc.

Strongly recommended as an invaluable program for home, business, or educational requirements.

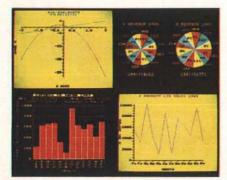
Users who have purchased earlier Gemini Database programs may exchange them for the new improved version by sending their disk or cassette, manual and £9.95 direct to Gemini

SPREAD SHEET ANALYSIS

"...Well documented, easy to load, excellent screen display."— Home Computing Weekly.

M.BSARD. DALE J PANHACING DIRECTOR PANHACING DIRECTOR GENINI MARKETING LTD Address (1) Address (2) Tour/City County Post Code Telephone 10/ML / Searchkeys HUBBARD, DALE J MANAGING DIRECTOR GENINI MARKETING LTD

MAILIST - "A very professional piece of software" —Which Micro.



Spread Sheet Analysis

Perhaps the most commercially successful item of business software yet written, the Spread Sheet processor offers a very wide range of invaluable calculation and editing features.

Consider, for example, a Cash Flow forecast containing rows and columns of figures, combined with text and numbers. If, say, the cash receipts for January need to be changed, it would normally be necessary to delete and re-calculate several figures for each successive month.

With SPREAD SHEET, however, an 'on screen' amendment to the January figure is made, and the corrected figures for each successive month automatically appear upon touching the 're-calculate' key.

Formulæ cells in the table may be specified which relate to

Mailist

each other and then copied RELATIVELY or ABSOLUTELY to other parts of the program, which in itself is modular, and directly linkable to other Gemini programs.

SPREAD SHEET has a complete range of inbuilt data entry and formatting techniques, and the structure of the table may be amended at any stage. Full printer facilities are included which allow for either the table to be printed or just the data and formulæ relating to the table. Another important feature, any valid BBC BASIC formula is acceptable as data entry making the system immensely powerful and versatile. The sister program GRAPHPLOT will take data from disk or tape files created by this program to provide data portrayal in graph, histogram or pie chart format.

New –£39.95 Random Access Mailist

A superb dedicated database to allow for manipulations of names and addresses and other data. Gemini's unique 'searchkey' system gives you a further ten 'user-defined parameters' to make your own selections. Features include the facility to find a name or detail when only part of the detail is known, it will print labels in a variety of user specified formats.

	711 35	487 18	
	750.08	611.37	130.71
MAINTENA	566 73	724 58	
RATES	690 34	642.71	47.63
INSURANC	414 62	708.36	
HOUSEKEE	598 51	662 14	63 63
HOTORING	478 37	556 50	20 21
ELECTRIC	469.04	564.21	99-17
DEPOS	488 84	622 04	133 20
SUBSCRIP		604 15	160 53
TELEPHON	468.85 589.34	603 03	134 18 83 33
SCHOOLTH	565 17	506 01	243 93
MEDICAL	603 82	482 72	121 10
LEGAL	743 28	779 96	36.68
CLOTHING	656.50	610 43	46.07
POPERS	395.35	654 62	959 27
HOLIDAYS	734 55	681 51	53 04
COMPUTIN	487 64	588 47	100 83
	773 27	443.75	329.52
TOTALS >	11629 28 1	2342 92	7.13 100

Graph Plot

Written specially for use with the BBC micro, this program makes full use of the high resolution colour graphics to provide an easily assimilated visual representation of numerical data.

For example monthly sales statistics comparing two year's results may be instantly converted into two side by side pie charts, histograms or graphs... for easier visual comparison and assimilation.

GRAPH PLOT also incorporates a built in machine code screen dump, enabling a high resolution printed image to

This program is an extended version of the standard Gemini memory based mailing list, providing random access files on disk, and improved printing facilities. The features of the program include:

Up to 2000 names and addresses can be stored and accessed as one data file — approximately 500 records for each 100 Kbytes of disk capacity, and up to four drives of 40 or 80 track format are catered for. Routines are provided for sorting the file alphabetically by name, searchkey, or other field heading, and for comprehensive search features, using ten user-defined searchkeys. Printouts that may be obtained include a field summary in column format, and up to 3 labels may be printed horizontally, with user specified tabulation. Suitable for most makes of printer with little or no modification.

Home Accounts

Designed as a complete Home Accounting package this program allows the user to set up a budget for items of household expenditure and compare actual expenditure with budget. A running total of all surpluses and deficits is available both as digits, and in the form of a bar chart.

A complete Bank account routine is included together with suggested expenditure categories such as mortgage, rent, rates, telephone, gas, electricity, etc, however, these may be deleted or augmented without difficulty.

be produced using an Epson or similar bit image compatible printer. It also interfaces with other Gemini programs such as Spread Sheet Analysis and Cash Book and is particularly recommended where any kind of mathematical plotting facility is required.

GRAPH PLOT — "Excellent displays with high resolution and good colour co-ordination" — The Micro User.

ore Programs.. more

Business Softwar

J 8 SNOOKER T/A POT BLACK	1983	1982		NOTEST	O THE ACC	OUNTS - 31/1	2/83	
BALANCE SHEET AT 31/12/83		4	1. FIXED ASSET	S				
Fried Asetts Goognalii	50560 2000	30950 2000		Lend & Buildings	Motor Vehicles	Plant &	THTAL	
	9000	32950	Cost or Velumian	50000	4000	2500	5650G	
			Acc Districution	5000	500	500	9000	
URRENT ASSETS			NBV 1983	-£45000	C3500	C(000	130600	
abton & Presentation abt in Hand AT recoverable	\$600 2000 500 500	3000 1000 200	NBV — 1982	£25100	£3700	£2150	£30950	
	8000	7200	Z. LAND AND BI		196	19	1982	
ESS CURRENT LIABILITIES:			Land and buildings co-	mpelyer				
and Creditors & Accrues	33900 800 9300	3300 1000 8250 600	Freehold Property Lessehold Property		200 290 £450	00	25100 E25100	
	44000	13150	3 CAPITAL ACC	OUNTS				
ET CUMBENT ASSETS/IL/ABILITIES/	(36000)	(19890)			101	121		
ET ASSETS/ILIABILITIES	¢ 16500	£ 27000	Opening Coons		15000	5000		
ERRESENTED BY			Add: Cannal Introdo	CYase	500 4300	6300		
soltal Aid (1) soltal A/c (2)	12300	18000 8000			21800	11300		
ong Term Coans	1000	5000	Laur Drawings		(8600)	1120001		
	17.16500	E 27000			C 12200	(000 13		

Final Accounts

Requires Cash Book module. This program will take your cash book data to the logical conclusion of balance sheet, trading and profit/loss account and notes to the accounts i.e. fixed assets, land and buildings and capital accounts. Interfaces with Graph Plot for graphic data presentation.



Invoices &

This program greatly reduces the time and cost of preparing Invoices and Statements by storing essential information such as customer names, addresses and account numbers. VAT routines and footer messages such as 'Please remit by return', 'Overdue and outstanding', etc.

Not only are Invoices and Statements produced more quickly and accurately, but pre-printed forms for them are eliminated since the program produces professionally formated documents using your own printer.



Word. Processor

This program provides many routines found in large and more expensive packages. With a typical word length of 5-6 letters it allows for up to 1000 words in memory at one time and is ideal for the user who wishes to write any kind of business letter on a home computer.

Features include, block delete, block insert, search and replace, edit text, display text, and many more.



Payroll

Managing the Payroll for up to 50 employees, this program is user friendly being menu driven, easy to use and supported by comprehensive documentation.

It shows gross pay, net pay and overtime for hourly weekly or monthly paid employees, and holds most PAYE and NHI data together with essential SSP information.

Payrolls are automatically analysed under departmental heads and the most frequently used PAYE forms such as P14, P35 and P60 printed when required.



Stock Control

Dedicated software with all that's necessary to keep control of stock. This program will take the tedium out of stock control and save time and money. Routines include stock set up, user reference number, minimum stock level, financial summary, line print records, quick stock summary, add stock, delete/change record and more.



Easiledger

Contains routines to enable the small businessman to keep a record of one of the most important aspects of his business-cash flow.

EASILEDGER is essentially a debit/credit ledger system. which can handle sales, purchase and nominal ledger routines to provide instant management information. Its flexibility lies in its ability to produce account balances instantly for debtors and creditors, together with a record of all transactions, dates and references. A year-to-date summary of sales, purchases, receipts and payments over the twelve month period is also provided as is a complete INTERACTIVE bank account database.

EASILEDGER is a management aid software tool and is designed to run alongside an existing accounting system. If you operate a cash based business and require a complete accounting package to produce the accounts to trial balance and beyond then we recommend you consider using both the Easiledger and Cashbook programs



Cashbook

Gemini's CASHBOOK is a complete 'stand-alone' accounting software package for the cash based sole trader/ partnership business. It is designed to replace your existing cash book system and provides a computerised system complete to trial balance.

Written by practising Chartered Accountants and coded by professional programmers, the system is practical, user friendly, and replaces manual cash and bank records. From sheaves of invoices and cheque book stubs, it will take you to trial balance and produce VAT summaries, Receipts and Payments analyses, departmental sales and purchases analyses, and a full audit trail

Combination

Designed to offer maximum value and convenience to the serious business or home user by combining several programs in one pack.

Business GAVING ... Pack No. 1 Contains: Graphplot, Spreadsheet Analysis Payroll, Cash Book, Final Accounts Price of programs in pack C.0113 BBC 32K Cassette D.0113 BBC 32K 40 Track Disk E.0113 BBC 32K 80 Track Disk 199 95 Combination Business Pack No. 2 Contains: Database, Stock Control, Word Processor, Mailist, Invoices & Statements C.0114 BBC 32K Cassette D.0114 BBC 32K 40 Track Disk E.0114 BBC 32K 80 Track Disk 19.80 Combination Business Pack No. 3 Contains: Database, Stock Control, Spreadsheet Analysis, Invoices & Statements, Mailist. C.1615 ELECTRON .. 79.95 19.80 Combination Home Pack No. 1 Contains: Database, Home Accounts, Mailist, Spreadsheet Analysis, Graph Plot. C.0116 BBC 32K Cassette D.0116 BBC 32K 40 Track Disk E.0116 BBC 32K 80 Track Disk C.1616 ELECTRON 39.80 44.80 19.80 Combination Home Pack No. 2 Contains: Database, Home Accounts, Graph Plot, Mailist. C.0417 SPECTRUM 48K

	_ 0
Available from most good software dealers an WH Smith and Boots, or phone Gemini for imme ing your Access, Visa or American Express care Telephone (0395) 265165/265832 Alternative cheque or Postal Order made payable to: Gemi	diate despatch quot- i number. By send your
Please send urgently: BBC 32K/ELECTRON (p	lease delete)
Please tick appropriate box. Prices include VAT at (UK only), for all programs on this double page, ex Final Accounts, Payroll, Random Access Mailist an	cept Cash Book,
☐ Cassette £19.95 ☐ 40 Tr disk £23.95 ☐ 80 Tr disk	£24.95 [] 3" disk£25.95
CASHBOOK & FINAL ACCOUNTS £59.95 PAYROLL £39.95 RANDOM ACCESS MAILIST £39.95	Same price for Cassette, 40 or 80 track disk or 3" disk—Please specify
Name	
Address	
Signatur Credit Card No. Access/Visa/American Express (delete)	
18a Littleham Road, Exmouth, Devon EX8 2QG	England

mu



THE MICRO USER **JUNE 1984** NEWS

QUEEN'S AWARD FOR ACORN. MICROVITEC

Technological Achievement for the BBC Micro. The award pays special tribute to the BBC Micro's advanced design and it commends Acorn "for the development of a microcomputer system with many innovative features".

IBM compatible upgrade for BBC Model B

looks as if it's going to leave rivals far behind, Data Technology has announced an IBM compatible upgrade for the BBC Model B.

Produced by a team whose members originally worked on the BBC Micro and Torch computers, the Graduate will upgrade the BBC Micro to a 16 bit business computer.

The development means that the Graduate plus the BBC Micro will give buyers IBM capability more cheaply than buying the IBM PC itself with the possibility of full colour as well.

So far BBC upgrades, including Acorn's own Z80 second processor, have tended to base their products around CP/M compatible machines.

The strategy has been to open the wide range of CP/M software to the BBC Micro owner.

But this ignores the fact



Martin Vleiland-Boddy: "We've a winning team'

that the major thrust of software development is increasingly towards the IBM Personal Computer. which uses PC DOS, not CP/M.

With the Graduate, it is claimed, BBC Micro owners will be able to take advantage of this everincreasing and highly sophisticated IBM soft-

The package looks extremely competitive. The minimum system -G400 - selling at £599, gives the BBC Micro not only 128k of RAM expandable up to 1.2 mbytes, but also a 400k BASF disc drive independent of the BBC Micro's DFS.

The second system, G800, selling at £869, has twin disc drives plus full colour word processing, spreadsheet and database programs.

Both systems have expansion slots to take advantage of the wide range of IBM add-ons such as communication cards and hard discs.

Driving force behind Data Technology is

Chris Curry, Acorn's managing director, said: "This is a special honour for Acorn because it highlights the technical achievements of the BBC Micro system.

"We have consistently aimed to design computers that have set technological standards instead of merely meeting

"Our approach is vindicated, both by the award and by the fact that two years since it was launched the BBC Micro



Chris Curry: "Setting technological standards

is still the most advanced computer of its kind".

The award also goes to Microvitec for the innovative technology of their Cub colour monitors.

The news came as Microvitec celebrated a record £9 million turnover in what is still only their fourth full year of operation.

Since the Cub monitors were introduced they have won approval from the BBC, the Department of Industry, the Department of the Environment and are said to be currently used in 95 per cent of Britain's schools.

Microvitec head Tony Martinez said: "I understand we are one of the youngest companies to receive the honour.

"Our market success during the four years of our operation has been entirely due to an all round team effort and the Queen's Award comes as a marvellous tribute to the work of all concerned".

Anti-pirate breakthrough

A LEADING software house has made a technological breakthrough which it believes will scupper most of the pirates currently pillaging the industry.

Rochdale-based A & F has developed the software at a cost of £20,000 to enable an anti-copying device to become 95 per cent

'We now have a system that will make it virtually impossible for school children and computer clubs to make audio copies or computer dumped copies of our software", Mike Fitzgerald, the company's managing director, told The Micro User.

"Not only that, but it will have serious implications for the professional pirates".

The device has been patented by Jim Lamont of JLC Data, Barnsley, who hit the headlines recently when the Ministry of Defence snapped up a similar invention of his and placed an embargo

"We had been talking to Jim Lamont about the one the MoD grabbed when the government stepped in and brought an end to that", says Mike Fitzgerald.

"It was at this point we decided to evaluate an earlier system of his. Now, three months later, we have the software to make it work".

Pseudo user groups are expelled

the founder of Torch

Said Martin: "We've

got a winning team

together. On the hard-

ware side there's Alan

Wright, who worked on

the BBC Micro and the

Torch. For software we've

got Paul Bond, who wrote

the BBC Micro OS, to help

"And, of course, on the

financial side there's my

brother Clive, who's

worked widely as a con-

sultant for companies such

as Acorn and Sinclair"

Computers.

COMPANIES with a commercial interest in the burgeoning BBC Micro market are trying to muscle in on the user group scene in the hope of making a financial gain, according to a spokesman for the Association of Computer Clubs.

The ACC is so concerned about the trend that it recently expelled Beebug and Laserbug from its membership.

"We were very unhappy about the fact that these organisations described themselves as user groups but in fact both clearly existed for commercial gain", said the spokesman.

OPERATING DISCS AT & EØØ IS NOW POSSIBLE!



Eprom for a £5 cash refund.

Please allow 21 days for delivery

Please note this is only suitable for existing DFS users

17 Cross Coates Road

GRIMSBY

South Humberside

Telephone: 0472 44304



Social worker Frank Arbour looks on as Thomas Lindley tries out his specially-adapted BBC Micro

Soft sales soar

DYNABYTE Software reports steeply rising sales graphs since they attended the Electron and BBC Micro User Show in

Although it was their first show, and they had one of the smallest stands, there was a queue to try out the games on their two BBC Micros.

According to sales executive Ian Mortimer business was "extremely busy". Dynabyte plan to be at the Electron and BBC Micro User Show in Manchester this August.

The firm has also had good reactions from customers about new packaging, which bears screen dumps so that games fans can get a better idea of what a game actually looks like when played.

Electronic mail network aids appeal

achieved a first using the BBC Micro over Easter when it linked up with Capital Radio in a charity appeal.

The result was that subscribers to the electronic mail network pledged a total of £1,000 to the radio station's "Help a London Child" scheme.

Two or Micronet's staff were on standby at Capital Radio throughout the Easter weekend, armed with a BBC Micro and modem to accept donations.

While the station's disc jockeys were encouraging regular listeners to contribute over the airwaves, the Micronet team were exhorting their own subscribers to take part by regularly posting bulletin boards on the viewdata service's database.

"It was a very success-ful exercise", said Adam Denning, Micronet's software and technical editor.

"We updated the screen every time we received a pledge in order to keep the interest going".

THOMAS Lindley has recently started his schooling. And so far he has delighted his widowed mother by being able to string a few words together - even though he is 46 years old.

is the key

For he was born a spastic and has remained almost completely crippled all his life.

In fact up until a few weeks ago, he was unable to master even a simple 'yes" or "no".

It is little wonder then that most people dismissed him as having the IQ of a five year old.

Then along came social worker Frank Arbour, who introduced him to a BBC Micro - and the real Thomas Lindley is now about to stand up and be counted.

A few simple tests on the keyboard was enough to reveal that Thomas, far from being mentally re-tarded, may in fact be a man of considerable intel-

Frustrations

"We are already convinced that most of Thomas's learning problems stemmed from the frustrations imposed by his physical limitations", Frank Arbour told The Micro User.

"Naturally it has not been easy going. We have found considerable difficulties due to the fact that his disabilities prevent him from making the maximum use out of the conventional keyboard.

"However we expect that people already working in this field will be able to provide some of the answers in the not too distant future".

The Tameside social

worker and his colleagues working on the case are hoping that not only will the BBC Micro open up educational horizons for Thomas but also eventually allow him some control of his environ-

What they would like to see is him using the micro to control electrical appliances around his home in Dukinfield where he lives with his 82-yearold mother.

Breakthrough

"If he could use it to switch on lights or boil a kettle, that in itself would be a major breakthrough", said Frank Arbour.

The BBC Micro now installed at his house has been bought jointly by the local authority and the Greater Manchester Spastics Association.

The Rev Oswald Lloyd-Roberts, director of the Association, said: "Inside Tommy is a lot of speaking. But we can't understand him and he gets very frustrated.

"At last he is going to be able to communicate with people".

The case of Thomas Lindley moved Paul Hartland of Information Technology, the Government-sponsored training scheme involving the disabled, to comment:

"Too many people still think of home computers as games machines. I believe we are now going to see their real value. It is all very exciting".

In the race

ALLIGATA Software of Sheffield is co-sponsoring a racing car this year.



HIRST AU

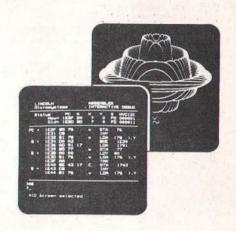
DUALSCREEN MONITOR ROM



AID is now clearly established as the finest machine code monitor ROM for the BBC Micro. Designed for beginners and experts, AID is both powerful but still very easy to use. With a comprehensive set of over 40 commands AID will satisfy the demands of the most experienced programmer. Beginners also will soon feel at home with AID's friendly prompts and responses which make it such a good learning aid.

AID can tackle many tasks, from debugging machine code programs to revealing the secrets of machine code games using the unique and highly acclaimed DUALSCREEN graphics feature. Delving into the mysteries of the OS ROM you will find AID a source of lasting interest.

If you are taking your first tentative steps into the world of machine code or planning to write a chart topping machine code game then you can have no finer help than DUALSCREEN AID.





Acclaimed by the press and users alike

66My immediate impression of AID was that it was a very professional product . . . AID offers additional features far in advance of other monitors . . . I found it easy to use, particularly as the user guide is very thorough and accurate . I wish I had something like this when I first started dabbling in machine code . . . The last facet I explored was the DUALSCREEN facility, which is perhaps the pearl of the system . . . In conclusion, AID seems a must for the serious machine code programmer and a very useful learning aid for the novice. It is a highly professional product in every way and could prove to be the standard by which others are compared. " "The Micro User" January 1984

66 Having had your AID ROM 'under the bonnet' for two whole weeks I am at last able to escape its fascination in order to say how delighted I am with it . . . As a beginner at assembly language programming, I am finding your ROM not only a very useful tool but also a real revelation, like having a window into the 6502 and the whole working area of the micro . . . It is very impressive and I am grateful that such a powerful facility exists at all . . . I cannot see how such an impressive feat of programming as your incredible AID facility can be anything other than a runaway success . . . I would like to add my grateful thanks. 99 C. Dent. Portsmouth



CASSETTE - The original cassette version of AID (fewer commands) is still available. Easily transferred to disk. Price £10.00 + p&p for cassette plus 25 page manual.

AID ROM plus 42 page user manual

p&p add UK £1.50 Europe £3.00 Outside Europe

The most advanced machine code AID for the BBC Micro

Crosystems Manchester M22 5WG

Dept DP1, 22 Lagan Walk Peel Hall

PROGRAMMERS!

Lincoln Microsystems will consider high quality BBC Electron Software for marketing in the UK and abroad. Advice and assistance is available for promising products. Excellent royalty cash purchase package.



20,000 see the big show

MORE than 20,000 visitors flocked to see the latest Electron and BBC Micro User Show held at the New Horticultural Hall, London, recently — some 2,000 up on the previous event last year.

At one time during the peak day on Saturday, one of the two turnstiles in operation had to be closed to reduce the intake as the large hall was packed to capacity.

And reports of record takings during the four days were received from the majority of the 83 exhibitors who attended the show.

"Naturally we were delighted with the overwhelming success", said a spokesman for Database Publications, organisers of the show.

"For our last show had been held just before Christmas which meant that central London was already swamped with people.

Growing

"To attract even more people to a March show proves that the public's interest in the BBC Micro and Electron – and all the hardware and software being produced for both machines – is growing all the time.

"It certainly justifies our decision to hold five shows a year – just to satisfy the demand".

Because of soaring interest the next London show moves to a much bigger venue – Alexandra Palace in North London.

Put these dates in your diary:

July 19-22: Alexandra Palace, London.

August 31-September 2: UMIST, Manchester.

October 25-28: Alexandra Palace, London

December 6-9: New

And now it moves to a bigger venue

Horticultural Hall, London.

Meanwhile back at the most recent show, an attempt to play computer games non-stop for 24 hours failed by just 55 minutes when the 14-year-old boy involved dropped off to sleep.

However Derek Creasey, from Stockport, is still eligible for inclusion in the Guinness Book of Records for completing his marathon 23 hours and five minutes ordeal.

The event was held to coincide with the opening of the record-breaking four day show.

"Up until about 20 hours he was going strong", reports one of the organisers.

"But then he developed a headache. So when he



finally nodded off we hadn't got the heart to wake him up".

The world record attempt was linked to medical research to establish whether or not prolonged playing of computer games can be harmful.

In order to study this Derek Creasey was hooked up to an ECG machine which monitored his progress throughout.

He was also tested at regular intervals for disorientation, lack of concentration and other possible ill effects.

Provisional results have given the current computer games craze the all clear. "During the attempt he showed no obvious signs of stress at all", said a medical observer.

"In fact the only symptom he displayed was what anyone else would have shown after 23 hours and five minutes non-stop doing anything – and that was just plain old fashioned tiredness".

Video training via BBC micro

THE Department of Trade and Industry is putting £100,000 into a project to produce an educational video system based partly on the BBC Micro.

It will train microelectronics technicians at the college run by the electricians' trade union, which is also putting cash into the scheme.

The idea is to combine unchanging information held on a laser video disc with volatile information stored on a BBC Micro.

The video disc will hold a mixture of still frames, live action and stock footage. Computer graphics will represent electronic circuits for fault diagnosis.

The system will go on sale to industry and training institutions next year.

According to Eric Parsloe, whose company, Epic Industrial Communications is setting up the system, it will provide a low cost solution to a major industrial training and productivity problem.

In addition it should help give the UK the lead over other countries.

MICROWORLD



SCOTLAND'S ONLY ACORN DISTRIBUTOR

EDINBURGH Microworld

12 Leven Street Tollcross Edinburgh 031-228 1111 Telex 72355 CLACON G



Model B with latest 1.2

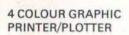
Operating System £399.00 Model B with Disc Interface ... £499.00 Model B with Econet £446.00 ALL EX-STOCK

KOSMOS JP80

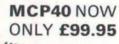
FULL FEATURED **80 COLUMN MATRIX PRINTER** (FRICTION AND TRACTOR FEED)

ONLY £229 INC. VAT. CARR. £6

FULL ONE YEAR WARRANT









(Authorised BBC Dealer and Service Centre) 12 LEVEN STREET, EDINBURGH, (Nr. Kings Theatre, Tollcross) TEL: 031-228 1111 (M-S 9-5.30)

All items subject to availability

Carriage £6 per item, all prices include VAT, please check price before ordering. Cheques must be made payable to Andrew Whyte and Son Ltd.





EDUCATIONAL & BULK DISCOUNTS AVAILABLE, ALSO COME AND SEE ECONET IN **OUR SHOWROOM**

We now carry the Apricot and Sanyo P.C.'s business machines

GLASGOW Microworld

11 Bath Street Glasgow G2 041-332 1116

ABERDEEN Microworld

77/83 Holborn Street Aberdeen 0224 571735

NOW OPEN

Microworld's largest showroom - specialising in Acorn BBC products. Word processing Packages designed to meet individual requirements.

Disc Drives

We carry a comprehensive range of 3 and 5.25 inch drives, from £165.00

PRINTERS

Kosmos JP80 (free carriage) £229.00	
Seikosha GP100A£215.00	
Seikosha GP250X£271.00	
Seikosha GP700 4-colour £425.00	
Epson FX80 £415.00	
Epson RX80 £279.00	
Epson RX80F/T £315.00	
Juki 6100£415.00	
Silver Reed Daisywheel only £325.00	
Olivetti Sparkjet JP101£299.00	
MCP40 colour printer/plotter £99.95	
Interface Cable for above £15.00	

MONITORS

Sanyo 14" colour	£225.00
Sanyo 14" colour med. res	£313.00
Sanyo 14" colour high res	
Microvitec 14" colour	
Cabel 14" colour	£225.00
Zenith 12" green	
Sanyo 12" green	
BMC 12" green	
BMCTurntable	

SOFTWARE: Full range of ACORNSOFT, IJK, MICRO-POWER, SUPERIOR SOFTWARE, ALLIGATA, GEMINI, plus good range of EDUCATIONAL software. Please call or SAE for list.

(Add 50p post per order.)

Contest for prep school pupils

PUPILS in preparatory schools are to have their own national computing contest, based on the BBC Micro.

The competition - the first of its kind - is being run by Satips, the Society of Assistants Teaching in Preparatory Schools.

Contestants can submit either educational programs or games for two contests, one for under 11s and another for over 11s.

A 11 programs, maximum 75 lines, must be original and bug-free. They must be submitted via a Satips member of school staff.

The entry fee is £1 for each program and the closing date is December 1. Prizes are not yet finalised.

Full details are available from the organiser, Robert Robson, who teaches science at a Norwich prep school. (Tel: 0603 868982).

Bibby on Basic

MIKE Bibby, Features Editor of Micro User, will be running a weekend course in BBC Basic for absolute beginners in

The course will be held at the University of Manchester's Holly Royde College. Starting at 6.45pm on Friday, July 6, it lasts until 4pm the following Sunday.

"The idea is to follow the same style I use in my beginners articles", said Mike, already an experienced lecturer on beginners Basic for the extra-mural department of the university.

"We'll be starting at the very beginning and building up slowly from there, learning good programming techniques as we explore Basic.

The aim is that by the end of the weekend even those who knew nothing about the micro will have a thorough grounding in BBC Basic"



Electronic classroom THE classroom of the takes its bow

future took a bow at the. Electron and BBC Micro User Show - and in doing so fueled the controversial debate about the future role of teachers.

"We set out to be provocative and succeeded", said Peter Brameld, of Database Publications, one of the joint organisers of the electronic classroom stand.

'Many teachers and theorists are worried that the computer will eventually replace the teacher in the classroom and that pupils will develop learning relationships with software programs and not with their teachers", he said.

We wanted to bring these fears into the open for proper discussion, and to support the idea that computers should be used simply as a valuable teaching tool or aid to complement a teacher's activities"

The Electronic Classroom featured 10 BBC Micros linked to the Symbnet local area network from Symbiotic Computer Systems.

The system was first developed for Apple computers, and has many similarities to the professional network used in a business environment.

Message switching allows a supervisor to send messages to individual users, to groups or to all users of the network.

Project identities are

allotted to users and these can be used as addresses for messages to various groups of people.

The messages are stored on disc until they are acknowledged or collected.

A password facility means it is possible to keep information confidential when required.

A major feature is that expensive peripherals such as disc drives and printers can be shared between micros.

And use of fibre optic cables means the maximum distance between any two computers on the system is nine kilometers.

This is particularly useful for universities or colleges of further education where resources and departments are often split over several locations.

The BBC Symbnet will run Acorn DFS software without modification and DFS ROMs are not required, say Symbiotic. It is also compatible with the tube.

Econet 2, the enhanced version of Acorn's networking system, is due for release next month.

It will be demonstrated at the next Electron and BBC Micro User Show to be held in London's Alexandra Palace.

DING BANANAS OVER BEEB

Windward Islanders have gone bananas over the BBC Micro.

The machines, supplied by Broadway Electronics of Bedford, will be used to reorganise stock control for the Caribbean islands' main crop - bananas.

More than £2,500 worth of equipment, based around the BBC Micro and Broadway's own disc

drives, have been flown out, following an order handled by the Crown Agents.

A specially insulated crate was used to protect the equipment from the tropical heat during transit.

How did this British company land an order from half-way around the world?

The Windward Islands Banana

Growers Association in St Lucia was put into contact with them via the Agricultural Research Council and the National Institute of Agricultural Engineering, which is also a client of the computer company.

Paul Vaughan, Broadway's MD, said: "This order illustrates the versatility of the BBC Micro".

ROM based software takes off

FIRMWARE – software stored on a ROM chip – is becoming standard for serious programs for the BBC Micro.

This is so much so that in many cases the available sockets inside the BBC Micro have been used up and enthusiasts have turned to ROM expansion boards in order to fit all their chips.

Watford Electronics, one of the leading firms selling ROM-based software, has issued a new 13 ROM expansion board for the BBC Micro.

The firm has also produced enough utility chips to fill all 13 sockets.

As well as the Watford DFS and the Beebmon machine code monitor, written by Andrew Bray of The Advanced User Guide fame, the firm has produced two new graphics screen dump chips.

The first, Dump Out 2, is a machine code hi-res

screen dump ROM for a wide range of printers.

The second chip, the Epson Dump ROM, is designed specifically for Epson RX and FX printers, allowing teletext graphics as well as multitone screen dumps.

Watford is also entering the micro communications revolution with its Termemu terminal emulator ROM for the BBC Micro and its Prestel Interface ROM.

Computer Concepts, already well known for the Wordwise word processor, is also expanding its range of firmware.

In addition to the graphics ROM and the Printmaster printer utility, it has released Caretaker, a Basic utility ROM.

Among other things Caretaker will allow the Basic programmer to recover a crashed or corrupted program and selectively renumber and/ or save parts of a program.

It also allows the use of single key entry of keywords.

Also planned for release – when the ROM chips are available – is the Accelerator, Computer Concepts' long-awaited BBC Basic compiler.

This is claimed to be the first full floating-point compiler available for the BBC Micro.

Acorn in laser disc drives deal

ACORN is to take part in a joint venture to manufacture laser disc drives in Hong Kong.

The company has reached agreement with BSR International to set up a new manufacturing operation under the name of Optical Information Systems in the Crown Colony.

A joint statement was released by Hermann Hauser, Acorn's chairman, and W.R.A. Wyllie, chairman of BSR International after the conclusion of successful talks in Hong Kong.

Reliability

Optical Information Systems' first product will be a compact laser disc drive which, claim the makers, will feature greater storage capacity, reliability and faster access times than currently available with floppy and hard discs.

This is in line with the new company's long term strategy to develop digital optical technology for computer data storage and retrieval.



HEARD ON THE GRAPEVINE ...

ALREADY known for its disc drives and the Amcom DFS, Pace has entered the rapidly growing field of micro communications with the Grapevine modem

Grapevine modem.

The low-cost hard wired device plugs directly into the telephone system by way of a standard jackplug.

It is capable of operating at 300/300 baud full duplex and also 1200/75 baud, the Prestel rate.

This means that using the Grapevine and suitable software, BBC Micro owners can access Prestel databases. They can also use bulletin boards such as The Micro User's own Microweb.

It can even go international, as it supports both the European and American transmission frequencies.

Pace is also supplying ROM-based software to work with modems such as the Grapevine in the form of Commeter.

form of Commstar.

This "drives" the modem, effectively turning the BBC Micro into a terminal with access to databases and bulletin boards throughout the

Race on for Z80 second processor

UPGRADE Technology is running neck and neck with Acorn in the race to launch a Z80 second processor for the BBC Micro.

As The Micro User went to press, it was clear that only a day or two separated the two companies.

Upgrade's commercial director Steve Matthews said: "Although not the first Z80 second processor to hit the market, ours has many advantages over the others".

Upgrade's product, which will be available first from northern dealers, has its own built in power supply and is a completely plug-in unit.

It has an internal disc controller, so does not rely on the micro having a DFS, and is suitable for either model A or B.

The disc controller will handle two drives, which can be easily and independently installed by the user via a software utility.

The unit also includes an expansion bus that allows the user to plug in up to three add-on boards.

These will expand the unit's RAM from 64k to 256k, adding serial, parallel or IEEE interfaces, extra hard disc storage or stereo sound synthesis.

The Acorn product,

though different in detail, is understood to be largely similar. It costs about £100 more, but this is offset by a large amount of bundled software.

Acorn's deal includes free office productivity programs – word processing, spreadsheet, database and graphics – a system generator for application software, plus CIS Cobol, Professional Basic and BBC Basic.

OLYMPICS ON BBC MICRO

THE BBC Micro has been programmed to simulate the world's best athletes in the main track and field events which feature in the Olympic Games.

In all cases – allowing for a slight random element – the computer achieves the current world record.

Ranging from the 100 metres to the hammer throw, it is accurate in all details from times to distances.

The games program package involved – called Micro Olympics – has taken several months to write due to the complexities involved.

Players attempt to beat the computer and so establish a world record of their own.

 See special offer on Page 79.

Hints for Hobbit fans

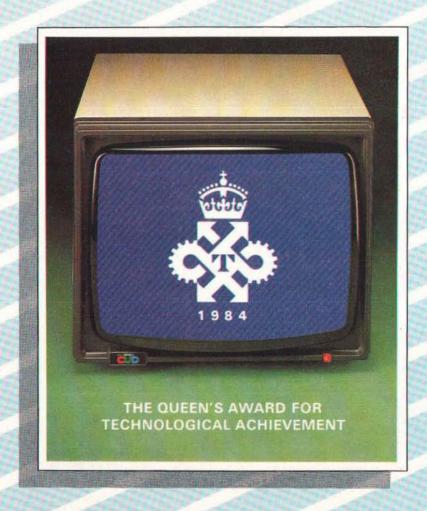
GOOD news for adventure fans who find The Hobbit habit forming but can't get there and back again.

Melbourne House has published "A Guide to Playing the Hobbit" by David Elkan. It is the first time that a guide has been published for a BBC Micro adventure.

In three increasingly easy stages the reader is taken through the program's problems and pitfalls, with hints and explanations given as necessary. As the game is different every time it is played, the guide is not a unique solution to the program, more a manual of strategy.

THE QUEEN'S AWARD

FOR TECHNOLOGICAL ACHIEVEMENT
THE RANGE OF COLOUR MONITORS MANUFACTURED
BY MICROVITEC ENABLES THEM TO BE USED WITH
MOST POPULAR MICRO COMPUTERS





To date, Atari's most astonishing game is Pole Position ... If you are only going to buy one game, then this is the one you should get.

COMPUTER & VIDEO GAMES.

...Pole Position gives a very strong sense of speed as you hurtle round the track. The super-realism of the three-dimensional effect adds a lot to the game. It is a three-dimensional effect adds a lot to the game. PRACTICAL COMPUTING. great graphics demo.

Brilliant!
WHICH MICRO? AND SOFTWARE REVIEW.

...a terrific version of the arcade motor racing game...graphics are superb...sound, too is very good as brakes screech and engines rev-up.

PERSONAL COMPUTER GAMES.

Exciting, exhilarating, excellent, Pole Position takes the lead as the best Atari race game around.

PERSONAL COMPUTER NEWS.

What can we say?



We're overwhelmed. Though we should just add that with Atarisoft, you can now play Pole Position on the Commodore 64, BBC and Spectrum computers, as well as on all Atari® systems. Oh, and we're giving away free a Grand Prix kit and full colour wall chart with every game.

POLE POSITION

From ATARISOFT*

- The complete AMS disc drive package, tailored to your BBC micro, is compatible with all disc interfaces and includes cables, a comprehensive manual and utilities on either disc or EPROM. Housed in a steel case. matching the BBC micro, these reliable and robust Hitachi 3" disc drives are the ultimate for home, office and classroom.
- The 3" disc is totally enclosed in rigid plastic and a unique automatic steel shutter protects the delicate disc surface from dust and finger marks. For the first time discs can be used in industrial, educational and commercial environments without the worry of corrupting precious programs and data.
- The disc is "flippable" like a cassette tape and has a storage capacity of 100K on each side in single density mode (twice as much when used with a double density interface). A neat plastic switch can be flicked back and forth to write-protect valuable discs.

- The AMS disc drives are completely hardware and software compatible with 51/4" drives which can be used in parallel so allowing easy transfer of software. Consequently the 3" drives will operate with all the standard floppy disc interfaces. They take their power from the outlet provided by the BBC micro-there's no onboard power supply to corrupt data.
- The AMS package includes utilities on either disc or EPROM for formatting and verifying discs. The EPROM, which is easily fitted, offers a simple to use and permanent alternative to using the utilities disc.
- The impressively engineered Hitachi 3" drives feature an eject button allowing single handed operation, a multi-colour LED indicating the disc side in use, and a brushless direct-drive motor for reliable operation. The super fast track-to-track access time of 3ms is at the forefront of disc drive technology. The longest of programs are loaded in a flash.

Advance with AMS 3" Disc Drives – The Ultimate Choice

Recommended Retail Price Sinale 200K*-*£199 (100K per side)

Double 400K_£385

(200K per disc)

includes VAT and delivery





Direct Deliver

If not available from one of our 200+ dealers fill in the coupon and we will deliver your order promptly Advanced Memory Systems Ltd. Green Lane, Appleton, Warrington WA4 5NG RING (0925) 62907 OR 62682

TO: Advanced Memory Systems, Ltd. Woodside Technology Centre, Green Lane, Appleton, Warrington Cheshire WA4 5NG.

Please send me

AMS-3 (S) single disc drive all inclusive package at £199 each AMS-3 (T) twin disc drives all inclusive package at £385 each Prices include utility disc, cables, manual,

VAT and delivery.

Oty

Please send me by post, if not with drives:

Oty double sided (100K x 2) discs at £4.95 each. packs of five at £22.50 per pack

Formatting and Verification Utility EPROM £17.25.

I enclose a cheque for E or debit my credit card



Post Code

Signature

No

Address

Tel No

Hitachi Word

p&h electronics L

HE PARADE, YATELEY 22/24 GUILDFORD ROAD NEAR CAMBERLEY, SURREY BAGSHOT, SURREY

MICRO CENTRES



BBC

Acorn Electron	£199.00
BBC Model A	
BBC Model B	£399.00
BBC Model B + Disc/Int	£469.00
BBC Disc Interface	£95.00
Speech Interface	£54.00
BBC Teletext Receiver	£220.00
View Word Processor	£59.00

BBC DISC DRIVES

Acorn/LVL 100K expands to	
double	£199.00
Acorn/LVL dual 100K	£350.00
Pace slim 100K	£190.00
Cumana 100K no P. supply	£170.00
Cumana 200K no P. supply	£220.00
Cumana 400K no P. supply	£250.00
Cumana 100K with P. supply	£195.00
Cumana 200K with P. supply	£240.00
Cumana 400K with P. supply	£269.00
Cumana dual 100K	£350.00
Cumana dual 200K	€445.00
Cumana dual 400K	€495.00
Cumana dual 200K 40/80	
switched	£535.00
Cumana dual 400K 40/80	
switched	£560.00
LVL DD disc int kit	
Pace disc int kit	
AMS 3" 100K drive	£199.00

ACCESSORIES	-
Cassette Recorder	£24.00
Cassette with Counter + Din	€29.00
Joysticks SW Self-Cen PR	£17.50
Joysticks Analogue PR	£17.50
Micro Dust Cover	€5.00
R.H. ELE Light Pen	£44.00
TV Aerial/Computer Switch	£2.50
Plinth for Monitor	£18.50
ROM Exp Board - 4 Slot	£20.00
Computer Desk + Mains Dist	£55.00
BBKEY, Function Key Mask	£1.50
Flow Chart Template	£1.50
Datapen with software	£28.00
Computer Desk double width	€55.00
Mains distribution block with	
plugs	£7.50
Clares Replica II	
Beebug Toolkit Eprom	£27.00
Beebug Exmon Eprom	

ACORNSOIT	
Business Games	29.95
Tree of Knowledge*E	29.95
Peeko - Computer/Manual	£9.95
Algebraic Manipulation	£9.95
Creative Graphics Cassette *E	29.95
Graphs and Charts Cassette *E	29.95
Desk Diary/Manual	£9.95
Lisp Cassette*E	£16.85
Forth Cassette*E	£16.85
Philosophers Quest	29.95
Sphinx Adventure	£9.95
Castle of Riddles	€9.95
Monsters*E	€9.95
Snapper*E	29.95
Planefold	£9.95
Arcade Action	£11.90
Rocket Raid	£9.95
Meteors*E	£9.95
Arcadians*E	£9.95
Sliding Block Puzzles	29.95
Cube Master	£9.95
Super Invaders	£9.95
Missile Base	£9.95
Starship Command*E	£9.95
Countdown/Doom	£9.95
Snooker	£9.95
Number Balance	£9.95
Word Sequencing	£9.95
Word Hunt	£9.95
Missing Signs	£9.95
Draughts & Reversi*E	£9.95
JCB Digger	£9.95
Hopper*E	£9.95
Chess*E	29.99
	The same of

SOFTWARE INVASION

3D Bomb Alley	£7.95
Vortex	£7.95
Gunsmoke	£7.95
Attack on Alpha Centruri	£7.95

BBC SOFTWARE

White Knight - Chess	£11.50
Dr Who	£9,99
Tool Box	£21.00
Beyond Basic	£11.50
Home Finance	£9.99
Record Keeper	29.99

BOOKS FOR YOUR BBC MICRO

Let your BBC Micro Teach you to Program	£6.45
Assembly Language Programming for BBC	£8.95
Advanced 6502 Programming	£12.45
Creative Graphics (Acornsoft)	£8.50
Graphs and Charts (Acornsoft)	€8.50
Forth Manual (Acornsoft)	£7.50
Lisp Manual (Acornsoft)	£7.50
Programming the 6502	£11.95
	22000 TV
6502 Software Design Easy Programming for BBC Micro	£10.25
	£5.95
35 Educational Programs for BBC Micro	£6.95
Further Programming for BBC Micro	25.95
Programming for BBC Micro	€6.50
Basic Programming on the BBC Micro	£5.95
21 Games for the BBC Micro	£5.95
30 Hour BASIC	\$5.95
BBC Micro Revealed	£7.95
6502 Sub Routines	£14.25
Assy Lang Programming for BBC	£11.95
Discovering BBC Machine Code	£6.95
Sound and Graphics	£6.95
Disc Systems for BBC NEW!	
Advanced User Guide	
Transca door daylor minimum mi	. 212.33

SOFTWARE FOR YOUR BBC MICRO

MICROPOWER	
Moon Base Alpha*E	£7.9
Moon Raider*E	£7.9
Nemisis	€7.9
Timetrek	27.9
Galactic Commander	£7.9
Asteroid Storm	£7.9
Swoop*E	£7.9
Alien Swirl	€6.9
Laser Command	£7.9
Space Jailer	£6.9
Martian Attack	£7.9
Positron*E	£6.9
Zarm	£7.9
Intergalactic Trader	8.9
Cosmic Combat	£6.9
Cybertron Mission*E	€7.9
Bumble Bee	£7.9
Caveman Adventure	€6.95
Felix + The Fruit Monsters*E	£7.95
Bandits at 3 o'clock*E	€6.95
Labyrinths of Lacoshe	£7.95
Croaker*E	£7.95
Danger UXB	£7.95
Cowboy Shootout	€6.95
Chess*E	£7.95
Killer Gorilla*E	£7.95
Hell Driver	£7.95
Demon Decorator	€6.95
Draughts	26.95
Felix in the Factory*E	27.95
Chemistry	£6.95
Constellation	£6.95
Physics	€6.95
World Geography	26.95
Where	€6.95
Draw	29.95
MONITORSCT	1

MONITORSCTV

Microvitec 14" colour	£230.00
Microvitec 14" High Res	€460.00
Sanyo 14" colour	£240.00
Sanyo 12" green	£90.00
Sony 14" CTV with RF input	£229.00
Philips 14" colour TV	£190.00
	£165.00

TO EDUCATION AUTHORITIES FULL SERVICE SUPPORT UPGRADE

E For ELECTRON PLEASE STATE

	 \sim	B	 	
100			-	100

Old Father Time	€9.50
Graphics Pack	£9.50
Sea Lord	£7.50
Oblivion	£7.50
Galaxy Wars*E	£7.50
City Defence*E	£7.50
Space Pirates	£5.50
Twin Kingdom Valley*E	£9.50
Space Invaders	£5.50
Music Synthesiser	£9.50
Control of Control of the Control of	S. 195

SUPERIOR	
Galaxians	£7.95
Centipeds	£7.95
Invaders	£7.95
Space Fighter	£7.95
Alien Dropout	£7.95
Fruit Machine	£7.95
Frogger	£7.95
Road Runner	£7.95
processor - ROM	€40.00
Logo - ROM	£29.00
Disc Doctor - ROM	£29.00

PRINTERS

Epson RX80T	£270.00
Epson RX80FT	£300.00
Epson FX80	£420.00
Epson MX100	€475.00
Epson FX100	£570.00
Silver Reed EX500 Daisy Wheel	£340.00
Silver Reed EX43 Typewriter +	
Int	£399.00
Brother HR15 Daisy Wheel	6470.00

GEMINI Business/Games

The second secon	
Cash Book Acc.	£95.00
Beeb Calc	£19.95
Inv. & Statements	£19.95
Commercial Acc.	£19.95
Mailing List	£19.95
Database	£19.95
Stock Control	£19.95
Home Accounts	£19.95
Word Processor	£19.95
Liberator	£9.95
Missile Control	£9.95
Add \$5 for disc versions	

NEW CENTRE NOW OPEN 22/24 Guildford Road, Bagshot, Surrey

Just off the M3

TELEPHONE ORDERS

Bagshot 0276 73078 Yateley 0252 877222

FAST MAIL ORDER SERVICE

SAME DAY DESPATCH ON STOCK ITEMS

P&H ELECTRONICS LIMITED

Unit 3 · Hogwood Lane · Finchampstead · Berkshire RG11 4QW CARRIAGE COSTS - Micro's, Monitors, Disc Drives, Printers, Desks £7 Books, Cassette Decks, Leads, Software 50p each item.

ACCESS, BARCLAYCARD VISA ORDERS WELCOME CREDIT FACILITIES Instant credit up to £1,000. Deposit 10%

P Watford Electronics



Dept. BBC, CARDIFF ROAD, WATFORD, HERTS. ENGLAND. Tel: Watford (0923) 40588/37774 Telex: 8956095 WAELEC



BBC MICROCOMPUTER

Model A-£260: Model B-£346

Upgrade your Model A with our Upgrade Kits and save yourself £ s s s

BBC1 16K Memory	
(8 x 4816AP-3 100nS)	£24.00
BBC2 Printer User I/O Port	£8.10
BBC3 Disc Interface Kit	£95.00
BBC4 Analogue I/O Kit	£8.25
BBC6 Expansion Bus Kit	£7.75

Complete Mod. A to B Upgrade Kit

ELECTRON MICROCOMPUTER

£199 (incl. VAT)

Dust Cover for BBC Micro

Protects your expensive Micro from foreign £3.50

SEIKOSHA GP100A PRINTER

10" Tractor Feed, 80 columns, 50CPS. Normal & Double width Char, Dot res graphics. Parallel Interface standard.

SPECIAL OFFER Only: £144

INTERFACE CABLE

BBC to Seikosha Cable

£7

FRICTION FEED

Attachment for GP100A or 250X Printers

£28

GP-700 Colour Printer Screen-dump routine in ROM FOR BBC Micro

£12



100 CPS, 9 x 9 matrix, dot addressable graphics, condensed and double width printing. Normal, Italic and Elite Graphics. Tractor feed, 10" max width, bi-directional, logic seeking. Centronics Interface standard.

ONLY £235 (£7 carr.)

EPSON RX80 F/T PRINTER

As above but has both Friction and Tractor Feed. £259 (£7 carr. Securicor)

PRINTER INTERFACE BUFFER

Neatly packaged self contained box, supplied complete with all leads, manual and detachable power supply.

Price: 16K Unit £99
Price: 48K Unit £135

Epson FX80 Printer

160 CPS, 11 x 9 matrix, proportional spacing, superscripts, subscripts, dot addressable graphics. Normal, Italic and Elite characters. Up to 256 user definable characters. Down loadable character set. Condensed and double width printing. Full proportional spacing. Four user defined margin positions. Tractor and Friction feed. 10" maximum width Bi-directional, logic seeking Centronics interface standard.

ONLY £324 (£7 carr.)

Epson FX100 Printer

Same as FX80 but has a 15" wide Carriage £495

Ribbons **Dust Covers** Type MX80FT £4.50 £5.25 £4.75 MX100/FX100 £10.00 FX80 £4.75 £4.95 £4.50 RX80 GP80 £4.75 £4.50 GP100 GP250 £4.95 £3.95 £5.95 £3.95 £18.50

RX & FX PRINTER INTERFACES

RS232 £35 RS232 + 2K Buffer £59 IEEE 488 £65 2K Parallel £58

BROTHER HR-15

DAISY-WHEEL PRINTER

An exceptionally high quality daisy wheel printer at the price of a dot matrix printer. 18CPS; bi-directional, 3K of buffer; has clear buffer facility, carriage skip movement, proportional spacing; underlining; bold print and shadow print. Prints in two colours; super and subscript facility. Impact control facility to vary pressure on paper for making carbon copies. Has Centronics parallel or RS-232 interface. Connects directly to BBC Micro. A ribbon cassette plus a separate red ribbon. Optional extras: single sheet feeder takes up to 150 A4 sheets; a keyboard that transforms HR15 into a sophisticated electronics typewriter. Attractively finished in beige.

ONLY £349

Single Sheet Feeder £199 Keyboard £150 Ribbon £3; Daisy Wheel £18

LISTING PAPER (Plain)

 1,000 Sheets 94" Fanfold Paper
 £7

 1,000 Sheets 15" Fanfold Paper
 £9

 Teleprinter Roll (Econo paper)
 £4

PRINTER LABELS (continuous stationery)

1,000 90×36mm £5.50 1,000 90×49mm £7.75 1,000 102×36mm £6.25 Carriage on Printer Paper or Labels £1.50

PRINTER LEAD 36"

Ready made printer lead to interface BBC Micro to EPSON, SEIKOSHA, NEC, STAR, JUKI, BROTHER, SHINWA, etc., Printers.

ONLY £7

Special Extra long 5 feet Cable

£10

WORD-PROCESSING PACKAGE

A complete word processing package consist of: BBC Model B, Zenith 12" Green or Ambe Monitor, Twin 200K highly reliable (1 year warranty) Teac Disc Drives in matching beige colour, the popular WORDWISE word proces Watford's own highly sophisticated 62 File D interface fitted, the world renowned Brother HR15 Daisy Wheel Printer, Gemini's Beebplo Beebcalc Spreadsheet Analysis Software disc 10 blank diskettes, 500 sheets of fan-fold pa Manuals and all the leads. To enable you to cyour Micro around, we shall pack it in our Antique Brown leatherette Attache carrying c

ONLY £1,275 (carr. £

(P.S. We will alter the package to suit you requirement. Call in for a demonstration).



This new JAPANESE printer has EPSON FX/RX compatible commands. 140 CPS Dot matrix Printer, offers NEAR LETTER QUALITY printing. 9 x 9 matrix. Friction feed, Adjustable tractor feed, Single sheet feed and built-in Par Roll Holder. Normal, Italic, Enlarged, Condens Super and Subscript, Dot addressable graphics (8, 9 and 16 pin modes). Proportional spacing (Optional extra: Down loadable character set il 8K ROM or RAM). NEAR LETTER QUALITY print, selectable at switch on. 10" maximum width, bi-directional, logic seeking. 3K Buffer. Half speed quiet mode. Convenient Paper-out sensor switch. Centronics Interface standard. Athis plus our no quibble 12 months warranty.

Special Introductory Offer: ONLY £2

KAGA KP910 PRINTER

Similar features as the above KP810 printer but has extra wide carriage. Will accept upto 17" maximum width paper. 156 column normal ar 265 column condensed.

ONLY: £3

AMS 3" DISC DRIVES

These popular mini disc drives, now available from WATFORD. For details see AMS advert this magazine. Supplied complete with cables, manual and utilities disc.

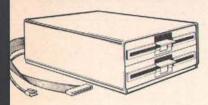
Single 100K per side

Twin 200K per side

SC DRIVES CASED WITH CABLES (less PSU)

(All Drives are NEW SLIM-LINE Type)

NEW LOW PRICES



CLS 100 Single, TEC Single sided 40 track 100K, 51" Disc Drive

CLS400 Single, Mitsubishi Double sided 80 track 400K, 54" Disc Drive £18

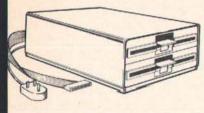
CLS400S Single, Mitsubishi Double sided 40/80 track Switchable, 400K, 51" Disc Drive

CLD200 TEC Single sided 40 track 200K, twin 5¼" Drives £252

CLD800 Mitsubishi Double sided 80 track 800K, 54" TWIN Drives £3

CLD800S Mitsubishi Double sided 40/80 £399 track switchable, 800K, Drives

CUMANA) DRIVES CASED WITH PSU & CABLES





CS100 TEC Single sided 40 track 100K 5½"
Single Disc Drive £145

CS200 TEC Single sided 80 track 200K 5\frac{1}{4}" Single Disc Drive

CS400 Mitsubishi Double sided 80 track 100K 51 Single Drive £259

CS400S Mitsubishi Double sided 40/80 track 100K 51" Single Drive CD200 TEC Single sided 40 track 200K 5\frac{1}{275}
WIN Disc Drives

CD400 TEC Single sided 40 track 200K 5 1/2"
WIN Disc Drives £365

D800 Mitsubishi Double sided 80 track

BOOK 51" TWIN Drives £425

D800S Mitsubishi Double sided 40/80 track Switchable 800K TWIN Drives £465

PARE DRIVE CABLES, SINGLE £6; DUAL £9

DFS Manual (comprehensive) £7.50 (No VAT)

ou do not require Formatting Discs when g our DFS as the formatting program is in ROM, nor do you require expensive 40/80 k switchable drives as with our DFS you can and write 40 and 80 track discs in an 80 k drive (software switchable).

MITSUBISHI SLIMLINE DISC DRIVES that supply are Double Sided, Double Density

1 Megabyte. (With BBC Micro 400K after natting.) When used in conjunction with ible Density board one obtains 800K (approx) r formatting. Track density 96 TPI, track to k access time among the property of the prop k access time 3mSec. These drives are very quiet and efficient. We strongly recommend LISA

54" DISKETTES

(Lifetime warranty)

Why settle for less, Buy the best.

10 Verbatim or 3M Diskettes S/S D/D 10 Verbatim or 3M Diskettes D/S D/D

DISCALBUMS

Attractively finished in beige leatherlook vinyl. Stores, protects and displays 20 discs in double-sided clear view pockets. ONLY £4.95

PLASTIC LIBRARY CASES



for Disc Storage 51 (holds 10) £2

LOCKABLE STORAGE UNITS



Attractively finished, strong beige plastic base fitted with dividers. Smoke acrylic top. Supplied with adhesive title strips for ease of filing.

M-35 Holds upton 35 mini discs £16

M-85 Holds upto 85 mini discs

FLOPPY HEAD CLEANERS

Unless your office/home is dust free, you should clean heads at least once a week to avoid the risk of cross contamination.

Simply apply the cleaner to one of the specially formulated cleaning discs, insert into the drive and initialise. If your system has no initialisation program then insert the disc and open and close the door 5 times.

READY-MADE LEADS

CASSETTE LEADS 7 pin DIN Plug to 5 pin DIN Plug + 1 Jack Plug to 3 pin DIN Plug + 1 Jack Plug to 7 pin DIN Plug £2.00 £2.00 £2.50 £2.00 to 3 Jack Plugs 6 pin DIN to 6 pin DIN Plug (RGB) £2.50 Monitor Lead, BNC to PHONO £3.00 Disc Drive to BBC Micro Power Lead Single: £3.00 Dual £3.75

MISCELLANEOUS CONNECTORS

	Plug	Socket	8
RGB (6 PIN DIN)	30p	45p	
RS423 (5 pin Domino)	40p	50p	
Cassette (7 pin DIN)	25p	65p	
ECONET (5 pin DIN)	20p	30p	
Paddles) 15 pin 'D')	110p	215p	
BBC Power Plug 6 way	75p	-	
Disc Drive Plug 4 way	70p	-	

EPROM PROGRAMMER for BBC MICRO



At last! — the EPROM Programmer for BBC Micro Computer from WATFORD ELECTRONICS that will suit both your pocket and all your requirements. Programs all popular types of EPROMS from 2K bytes up to 16K bytes — 2716 — 2516 — 2532 — 2564 — 2764 —

This extremely powerful system is designed for your needs of TODAY & TOMORROW! – BBC Basic programs can be copied into EPROM and subsequently re-loaded faster than from a disc! Suitable for both hobbyist and professional users!

Just look at these features:

COMPLETELY SELF CONTAINED —
Housed in its own sturdy case — Uses its own power supply — connects directly to the 1MHz Bus — Simple and Safe!

FULL SOFTWARE SUPPORT — Comes

complete with simple to use fully machine code ROM based software and easy to understand manual. Facilities include Varification, Reading, Virgin Testing, Writing, Editing, Saving, Loading and more! NOTE!! – This software does not simply comprise hastily reported routines to get you coing but is a prepared routines to get you going, but is a professional, purpose designed applications

package.

ACORN BUS COMPATIBLE - Use of the 1MHz connection complies with all Acorn addressing recommendations – That means you can still add-on such things as the TELETEXT IEEE 488 TUBE and PRESTEL

Allows more than one program to reside in an EPROM using the ROM Filing System.

ONLY £79 incl. Manual (£3 carr)

MONITORS

MICROVITEC 1431 14" Colour Monitor, Ro Input. (as used in BBC RGB programmes) FREE Interface

Special Offer £179 Lead.

MICROVITEC 1451 Hi-res 14" Monitor incl. lead NEW MICROVITEC 14" Colour Monitor/Composite Video KAGA RGB 12" Medium

Resolution Colour £195 KAGA RGB 12" High Resolution Colour £259

KAGA 12" Standard resolution colour MONITOR/COMPOSITE VIDEO ONLY £195 **BNC** Connecting Lead **RGB** Connecting Lead £5

ZENITH 12" High resolution, jitter free picture, Amber or Green £75

Carriage on Monitors £7 (Securicor)

SWIVEL MONITOR BASE



Attractively finished in beige, our swivel base allows you to tilt/swivel your Monitor to any required angle for comfortable viewing.

ONLY £18

£295

£249

Continued |

NEW Mk II 13 ROM SOCKET BOARD

Now all lines fully buffered - On board battery back-up facility - will now accept EPROMS 2716, 2732, 2764 & 27128 and ROMs 6116 & 6264.

Simply plugs into one of the four ROM sockets currently available in BBC Micro. There are only 5 solder connections to be made. Full instructions are supplied. This board has been ergonomically designed to enable the user, easy further expansion inside the Micro, e.g. Double Density Board, Torch Board, etc. (At Watford, we

think ahead.)
Our 13 ROM SOCKETS BOARD enables the
User to increase the Sideways ROM capacity User to increase the Sideways ROM capacity the basic four sockets on the main board upto the full SIXTEEN capable of being supported by current operating systems. In addition the board is designed with the facility to hold upto 16K RAM, which when switched into operation is automatically selected by any WRITE signal to the Sideways ROM area. This gives the User the ability to write a utility or language and upon pressing break have the utility or language up and running (new ROM software can be developed and tested in situ.)

The Board gives the User, plenty of freedom to explore the possibilities of the new paged ROMs due in the coming months and offers them the chance to develop their own.

All lines are fully buffered and the Board meets or exceeds all timings for operation in the BBC

or exceeds all timings for operation in the BBC Microcomputer. When fully populated, the ROM Board consumes less than half the recommended maximum current limit.

Supplied ready-built and tested complete with fitting instructions.

ONLY £32.50 (carr. £1)

EPROMs & CMOS RAMs for BBC MICRO

2764-250nS (8K ROM) £5.95 27128-250nS (16K ROM) 6116-150nS (2K RAM) £24.00 £5.75 6264-150nS (8K RAM)

BEEB SPEECH SYNTHESISER

VERSATILE SPEECH SYNTHESISER UNIT FOR THE BBC MICROCOMPUTER



Watford Electronic's very own Speech System.
Specially designed so that even a novice can
make his BBC talk:SIMPLY the best! — An unlimited speech
synthesis system. Complete with
easy-to-follow manual. Controlling software is in ROM so no Cassette Loading problems!

PHONEMES for word synthesis – That means unlimited vocabulary! No extra speech dictionary chips to buy!

BUILT-in Library of approximately 500 words to

BUILT-in Library of approximately 500 words to get you started.

ENGLISH accent — Utilises inflexion techniques to produce highly comprehensible speech.

EASY to use system — Just plug the software ROM into a socket, the Speech unit into the User Port, and away you go! No specialised 'dealer upgrade' required!

COMPACT unit — The whole system is built into a small case — easily tucked behind the computer. Auxillary output socket provided for direct connection to an external amplifier.

amplifier. HOURS of fun! - Suitable for any application -Games, Educational Programs, Specialised Packages.

We know this all seems to good to be true but DON'T BE LEFT SPEECHLESSI Order your Versatile Speech Unit now!

Only £44

THE ULTIMATE DFS FOR BBC MICRO

by

Watford Electronics

Highly acclaimed at The ACORN and BBC MICRO USER Shows. What do the independent press say?

Good value for money – Beebug Aug. '83 A very worthwhile package – The Micro User You'll be buying a very powerful package – Personal Computer News Superior DFS; Excellent disc sector editor -Computer Answers

Without a doubt, the most sophisticated DFS Software yet written for BBC Micro Computer. This powerful new DFS is fully compatible with ACORN DFS yet has much increased power due to additions, carefully designed to make life easier in normal use. It consists of over 14K of efficiently written machine code. It is entirely self contained and so does not require a utilities disc to function.

- The system can either use the ACORN standard 31 files per disc side or DOUBLE THE CAPACITY to 62 files. The size is selected at formatting time. Copying between discs with different catalogue sizes works perfectly permally.
- A FORMATTING PROGRAM is built in, permitting formatting to 35, 40, 80 track formats with either 31 or 62 files. Since the formatter is built in to the DFS it can be used without affecting whatever program you are using
- A DISC VERIFIER is also built in. This checks the internal checksums on each sector to identify any corrupted data. This is extremely useful when saving valuable data as it shows faulty discs quickly and easily. Again it does not affect the program you are using.
- A built in DISC SECTOR EDITOR gives a screen window onto the disc enabling detailed editing of any byte on the disc. This is very useful for recovering accidently deleted files and can save weeks of work.
- A double step mode allows the User of 80 TRACK DRIVES TO READ & WRITE BOTH 40 and 80 TRACK DISCS. This mode is software selected for each drive individually, thus enabling a 40 track disc to be copied on to an 80 track very easily. THIS ELIMINATES THE NEED FOR EXPENSIVE 40/80 TRACK SWITCHABLE DRIVES.
- A WORKFILE function sets the name to be used when the null filename is issued. This allows a program to be edited and repeatedly saved having only typed its name once
- When using LOAD, CHAIN, etc, it is possible to specify an ambiguous filename. This will result in the first file whose name matches the specification being used. This saves typing the end of a filename that you know is uniquely identified by its first few characters.
- Two commands exist to simplify the transfer of programs from TAPE TO DISC. These load the file to &1100, switch off the disc system and then move the file to its correct load address; thus saving a lot of complicated programming. This command can be used to load files up to 27K75 long.
- An advanced COPY command is included which will prompt the user, requesting whether to copy each file.
- RENAME has been extended to allow the use of ambiguous filenames. This allows you to change BERT1, BERT2, BERT3 to FRED1, FRED2, FRED3 with only one command.
- OPENOUT has been improved to give you fewer annoying 'Can't extend' errors, as it automatically picks the biggest space on the disc in which to put a file. A SPACE command lets you know how much space *COMPACT could create before you waste time doing it.

Continued:

BEEBFONT ROM

BEEBFONT is a remarkable new concept in BBC software, exclusively available from Watford. Once fitted, the 16K ROM will enable you to produce attractive text displays in following

abcdefghijklmad; arcde jobijki mao: ABCDET GHT JKLMNO abcdefghijklmno lA B C D E F G H I J K ABCDEFGHIJKLMNO abcdefghijklmno ABCDEFGHIJKLMNOI abcdefghijklmn ABCDEFGHIJKLMNO

It works in modes 0, 1, 2, 4, using full colour

Simply use Ctrl-V to select the font and all further screen output will be in a new style.

* Even the ordinary Beeb character set can be

enhanced by doubling height or width and emphasising to give bold print.

* A comprehensive editor is included which enables the user to design his own characters.

* A spooling program is provided, which enables pre-formatted text files to be displayed on an EPSON FX, RX, and NEC Printers, using the full range of character styles. (Please specific printer type when ordering). Can be used with WORDWISE.

* This really must be one of the most original

* This really must be one of the most original and exciting products of the year.

* A twenty page manual is provided and the demo/editor software comes on disc or cassett (please specify when ordering).

ONLY £3 ONLY £3

DFS continued:

2K of RAM can be reclaimed from the DFS by setting "PAGE" to & 1100.

Now with extra features:

- The powerful library system has been extended so that libraries now work on all accesses not only *RUN. This allows you to ha a utility directory with all your commonly used programs without muddling in your current workfiles. Very useful for BCPL User.
- Programs can now reside lower in memory reclaiming some of the DFS' workspaces, indee PAGE can be taken as low as £1100 under me
- To make DFS easy to use, wild cards (" have been made vastly powerful, e.g. *INFO *A gives information on all files in the current directory which have an "A" anywhere at all in their filename.
- Comprehensive and clearly written Manual (available separately) gives the user a complete package deal.
- Fully compatible with BBC TELETEX and TORCH Systems.

DFS ROM ONLY £2
Complete Disc Interface Kit including DFS
ROM and fitting instructions. P.O.A **DFS ROM** ROM and fitting instructions. P.O./
Comprehensive and clearly written DFS Manual.

P.S. We will exchange your existing ACORN DF or PACE (AMCOM) DFS for the highly sophisticated Watford's DFS ROM for

Watford's DFS is exclusively available from Watford Electronics. We DO NOT retail through any Dealers.

WATFORD'S BEEB PRINTER ROM



re you fed up with not being able to unravel your rinter manual and use all those features you paid or? Need sensible paging for use in the creation of poklets? Then you certainly need our Beeb Printer

machine code printer utility in ROM.

'Single' key operations replace control code equences for underline, font and size selection, aper movement, etc. Up to 30 come pre-defined, ithout effecting normal fn key usage.

This rom allows easy control of your rinter from 'Within' WORDWISE text. stead of long escape sequences, you just DC' a single number to Select, Underline, rint Styles, etc.

Automatic fanfold page margins. Puts gaps in stings. PRINTed text etc to skip the folds. The gap ize alternates to minimise paper wastage when sing binders.

Form feed and related commands, made vailable on ALL printers. Can also provide a left hargin.

User defined characters embedded within text re printed as on VDU.

The printed as on VDU.

★ Commands select option for GP100, STAR, NEC. MX/FX, LP VII/DMP100, DMP200.

Degrates with Parallel and Serial Printers.

Fully functional with the popular WORDWISE

Supplied complete with a comprehensive 50 page

Price: £24

(When ordering, please specify printer type)

SPECIAL OFFER

BUY BEEB PRINTER ROM and any one of the two

ONLY: £33 (A saving of £7+)

TWO GRAPHICS SCREEN DUMP ROMS

DUMP OUT 2

A versatile machine code hi-res Screen Dump ROM.

You can now have small or large 2 tone lumps and multi-tone 'colour' pattern dumps B distinct mode 2 shades) on every printer.

*Commands initiate the required dump
potional parameters may be included for colour nasking and selecting the part of the screen to

Clever use of the processor stack means hat no workspace is required! (Multitone lumps also use 2 zero page locations.)

For GP80/100/250, STAR, NEC, EPSON MX/RX/FX, LPVII, DMP100/120/200/400.

Screen modes 0, 1, 2, 4, & 5.

Instruction Manual

All this for

ONLY £15

EPSON DUMP ROM

A specially designed Dump ROM for EPSON RX, X and the new Kaga KP810 Printers. Will ccurately DUMP all Screen modes including ELETEXT, GRAPHICS and DOUBLE HEIGHT. MULTITONE DUMPS are also supported. Simple ingle command (*SCDUMP) operation.

Only: £16

WATFORD JOINS THE COMMUNICATION REVOLUTION

MODEM 84



Prestel

A British Telecom Service.

With the launch of Watford's MODEM 84 you can now hook into PRESTEL, MICRONET, HOMELINK, TELECOM GOLD, etc., for about the cost of a good tape recorder. Prestel gives you access to an incomparable database covering almost every subject under the Sun. There is Micronet with lots of free programs that you can download and run. Details of Clubs and User groups, a diary of meetings and exhibitions, news and reviews, technical information, etc. There is Homelink with On-line banking. And there is armchair shopping, travel information, Entertainment, World News, Sports News, Business News, Weather information, Electronic mail and lots more. The basic Prestel subscription is only £5 per quarter for domestic user and at off-peak times there is no charge for access time. Can you afford not to be part of this revolution?

Now using the latest techniques and the new generation of Modern chips, Watford have developed a Modem that is newer, better and yet cheaper than any on the

market.

Compare the Specifications:

MODEM

- Direct-connect Modem using BT approved isolation components.
- Full Duplex V23 operation for Prestel and TELECOM GOLD operation (1200/75 Baud).
- User-to-User half duplex 1200/1200 Baud operation with AUTOMATIC SEND/RECEIVE switch (BEWARE - most MODEMS switch manually between send and receive, which precludes the use of intelligent user-to-user software).
- Simple single button operation and comprehensive LED status display.
- Attractive Beige case to match your Micro.
 Sized to sit on the disc drive.

(P.S. BT approval applied for).

NEW SUPER PRESTEL INTERFACE ROM

Fully compatible with Watford's MODEM 84 as well as with PRISM and most other Modems.

- Supports full Prestel Colour Alpha and Graphic Characters including Double Height, Flashing, Conceal/Reveal.
- Called by simple *PRESTEL command. Disc and Tape configurations fully supported.
- Telesoftware downloader included.
- Comprehensive MAILBOX facilities including offline editor.
- Auto Logon sequence, can be burnt into ROM if desired.
- Unique "TAG" facility allows tagging and recall of interesting pages – avoids the common and annoying 'NOW WHERE WAS THAT PAGE'
- Page load and save to tape or disc. Pages are automatically saved under Page Number reference in a 'FRAME' directory.
- Print page options are ASCII only (i.e. with supression of Graphics) fast and works with any printer as well as a full graphics dump for the popular Epson printer.
- 'USER' function call built into interface with specialist add-on routines (your own as well as
- All the above facilities available from Function. Keys. An overlay is provided giving simple yet comprehensive guidance to the key functions.
- Comprehensive instruction manual supplied.

SOFTWARE in ROM incl. Comprehensive ONLY: £25

MODEM 84, SOFTWARE in ROM & Operating MANUAL ONLY: £75 (carr. £1.50)

(Please allow upto 28 days for delivery)

Coming soon: BEEB User-to-User ROM. For automatic user-touser communication including file/program transfer. (Requires Watford's MODEM 84 or

PRISM 2000). Please write to Watford Electronics for full details, Order and Application Forms.

FX80 PRINTER DRIVER for VIEW

Do you want to use Italics or Enlarged Characters with View? French or German Characters with View French or German
Characters? These and other FONTS from FX80
character sets can be accessed using our Printer
Driver with VIEW. The disc contains an example
as well shows how to use. Available on 40 or 80 ONLY: £7.50 track Disc.

ONE STOP SHOP

VIEW

Acorn soft's Wordprocessor ROM.

€52

FORTH ROM for BBC

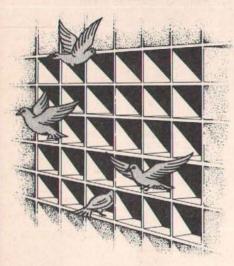
This superb (FIG FORTH) compiling language now available in ROM. Simply plugs into one of the ROM Sockets. Manual included.

> WATFORD **ELECTRONICS**

Continued -

WONDERFUL WATFORD

TWO NEW **DATABASE SOFTWARE for BBC Micro**



DISCDATA

At last for BBC Micro Disc users, Watford Electronics have produced 'DISCDATA' which must be the most versatile general database at the price on the market. The length of your files is restricted only by the space on your disc. You can have upto 20 fields with 'page' length records of upto 254 characters. The program is completely menu driven obviating reference to a manual although written guidance is given with the program. Add and delete records, amend title, field names and records, sort on any field and search for any record or group of records in title, field names and records, sort on any field and search for any record or group of records in any field, you do not need to abandon or rewrite your files if you wish to add additional fields or extend the length of any field, the program will rewrite the files for you. Your files can be in any drive. Output can be in 40, 80 or 132 character width with Printer routines. Two forms of output are provided for horizontal for label type output and a tabulated output with title and headings. What is more, the selected fields can be placed in any order on the screen. In the horizontal mode you can scan backwards or forwards with wrap around effect. Output can be started or stopped anywhere in the file. There is automatic count of the number of records output.

Now with extra 3 features: Allows string search; Calculations can be done on numeric fields; Create Sub-Files from the main File.

On disc at

Only £15

It has to be the best value.

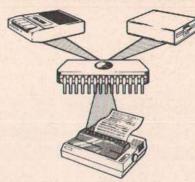
FILE-PLUS

A 16K ROM containing the most flexible and easy to use disk based Database system on the market. A database may occupy your total on-line storage capacity. You may design any number of data entry forms using a "paint" on screen technique. Forms may be upto 3 screens in size. A form may be used to Add, Delete, Update, Print and Spool records from your Database. Quick search facility on any text field. A query language provides full maths support (-, +, /, *, +-999999999.999) and compare facilities (=, >, <>, <=, ->, &, 1) when used with the keywords – Assign, Compare, Display, End, Goto, Iff, Ift, Print, Read, Search, Spool and Update. Full printed output control via embeded commands. Supplied with 70 page manual and fitting instructions. manual and fitting instructions.

Only £43

Send SAE for Fact Sheet

* STAR LAUNCH * **BUFFER & BACKUP ROM**



A very versatile firmware. An ideal ROM for engineers, programmers, teachers, students, etc.

- * Converts your Sideways RAM to a 4K or 16K BUFFER for a parallel printer. (Uses * FX5,3). (You no longer require to purchase expensive (£100+) Printer Buffers.)
- Dumps selection of Disc files to Tape
- Makes backup copies of tapes onto Tape, Disc and Hobbit.
- * Displays contents of a chosen paged ROM on
- Menu display on 'shift-break' using ROM Filing System
- Comprehensive Manual Simply a give away at

£18

In keeping with our tradition of bringing you the best in BBC Micro at prices you cannot refuse, we are launching yet another of our ROM based software.

TERMEMU

(A Terminal Emulator ROM for BBC Micro)

Use your BBC micro as a VDU terminal, connected to any other computer with a V24 or RS423/RS232 serial interface. Transfer text files in either direction, using disc or

tape filing system.

Powerful function set allows emulation of popular mainframe terminals, including full DEC VT52. A tailoring program is included which allows you to define your own terminal and save

the file on disc or tape.
The TERMEMU ROM is entered either using *VDU, or directly when the BBC micro is

switched on. Features include:

- Compatible with BT GOLD electronic mail
- Full BBC graphics available Split baud rate for receive/transmit
- User-defined function keys Visible control codes (for debugging protocols)
- Full cursor addressing User-definable addressing convention ALL OS commands available, even when
- SPOOL and EXEC, even at 75 baub Parity, start/stop and number of bits
- Change baud rates online Online/local operation
- Runs in any mode Comprehensive manual and fitting instructions

ALL THIS and MORE FOR ONLY £24 (Price includes tailoring software on disc or cassette and manual)

Suitable cable for RS423 domino to V24

ONLY £5

PACKAGE OFFER

BBC model B, ZENITH 12" monitor, plus TERMEMU and cables, a complete mainframe terminal for:

ONLY £445

ACCESS HOT LINE (0923) 50234 24 hours

GEMINI'S BUSINESS SOFTWA

Cashbook Accounts	£
Final Accounts	£
Invoices & Statements	£17.
Commercial Accounts	£17.
Mailing List	£17.
Database	£17.
Stock Control	£17.
Home Accounts	£17.
Beebcalc Spreadsheet Analysis	£17.
Beebplot	£17.
Payroll	£

N.B. All the above Gemini software is on to For Disc Based (40/80 track) please add £3

VERSATILE LIGHT PEN SOFTWARE

- Enjoy, Explore, Educate1 Pixil, Line, Character Definition
- Free hand drawing
 All Colours MANY Special Effects
- Fill, Refill and Stripes
 User defined "Brushed Strokes" plus
- Oser defined Brushed Strokes plus
 Character definer
 Grid, Scale, Perspective aids
 2 TO 200 Points palletable in one Design
 with Circles and "RUBBER BANDING"
- Move design/character to any screen positi Save and Load screens, User defined Grap and line drawings for video titles, Own
- programmes, etc. Many Educational uses
- Instruction booklet included
 Full software support for "CUSTOM USE"
 Works with Watford, RH, Acorn User, DIY, and many other LIGHT PENS
- - Available on DISC or TAPE Price: Tape £10; Disc £11

DISC EXECUTOR

Disc Executor is a sophisticated disc utility, designed for the BBC Micro, which allows you to transfer almost all of your tape software to disc. It will handle 'Locked' programs and allows you to load full length adventure type programs (i.e. up to &6E blocks) from disc in seconds rather than glouted Application. seconds rather than minutes. Available in 40 d 80 track, please specify.

Price: £10

Now available from Watford

The complete program development package on 16K ROM. A must for all the Assembly Language Programmers.

Introductory price: Only: £52

GAMES SOFTWARE (PROGRAM POWER)

CHESS	£6.95
CROACKER	£6.95
Escape from MOONBASE ALPHA	£6.95
CHUCKIE EGG	£7.90
FELIX in the FACTORY	£6.95
GALACTIC COMMANDER	£6.95
KILLER GORILLA	£6.95
MUNCHYMAN	£5.95
MOONRAIDER	£6.95
PENGO (Watford)	£7.75
SWOOP	£6.95
747 FLIGHT SIMULATOR	£7.75

LEVEL 9 ADVENTURE GAMES

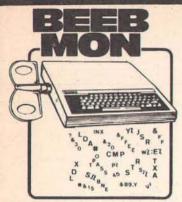
COLOSSAL ADVENTURE. The classical mainframe game "Adventure" with all the original puzzles plus 70 extra rooms.

ADVENTURE QUEST. Through forest, mountains, desert, caves, water, fire, moorland and swamp on an epic quest vs tyranny.

£8.5 DUNGEON ADVENTURE. Over 100 puzzles in

the Demon Lord's dungeons. £8.5 SNOWBALL. Save a 7000 location colony starship in 2302 AD.

£8.5



Watford's own Machine code Monitor ROM vritten by Andrew Bray (Cambridge), co-author of the BBC Micro Advance User Guide.

he most powerful and versatile machine code nonitor ROM yet written for BBC Micro. It has Il the normal memory editing, moving and elocating facilities, plus all editing is with a full creen editor allowing scrolling up and down nemory, entering in Hex, ASCII or standard ssembler mnemonics.

n use as a debugging tool, you run code under total emulation system. Everfelt a desperate rge to set a break point in ROM? No problem you can even have breakpoint on reading or you can even have breakpoint on reading or viting locations in memory and on register ontents. The system fully supports debugging f sideways ROMs e.g. BASIC can fully and asily be run from within Beebmon and from here DFS and other sideways ROMs can be

sed in total emulation mode. Beebmon can even run itself. In so doing you an nest Beebmon up to a level limited only by he memory size. Beebmon uses 256 bytes of vorkspace, located anywhere in memory, even in the 1MHz Bus. Beebmon effectively uses no ero page workspace, so your program (e.g. ASIC) can use any or all of the base page. low does it achieve this? By providing a 6502 nterpreter all programs running under it exist a vertual BBC, so special memory locations ke the ROM latch are not actually accessed your programs, instead they alter a location Beebmon's workspace. Emulation also llows immediate return to Beebmon command evel by ctrl-escape no matter what code is eing excuted at the time. All this exceptional ower and flexibility is complemented by a ear and detailed manual included in a value pr money price of:

PECIAL OFFER THIS MONTH

£19



cover the hidden secrets of BASIC and the

scover the hidden secrets of BASIC and the PERATING SYSTEM with this easy to use orgammers tool.

ROM based machine code Disassembler for a BBC micro. It enables machine code ograms to be listed in BASIC/DUMP format d thus is the perfect complement to the built assembler. It allows Sideways ROMs, files on sk or tape to be listed, and also has a more heavier editor, allowing magnetics to be armorehensive editor, allowing mnemonics to be tered directly, as well as HEX, DECIMAL, ASCII d BINARY memory editing. There is also a full t of labelling facilities available (up to 3,200 bels), with the major locations and routines ready labelled.

us DIS-ASM enables any monitor program, ch as BEEBMON to be used to much greater foot as it is not accessorate disassemble.

fect as it is not necessary to disassemble emory each time the display is altered.

these and other facilities for

ONLY £16

ice includes a comprehensive manual and ing instructions.)

DISC DOCTOR

A sophisticated Disc Utility ROM with many useful commands. (For detail description please refer to Computer Concept's advert in this magazine.)

Wordwise

Without doubt a very sophisticated piece of software for the BBC Micro. It has all the features of a professional word processor yet is easy to use

SPECIAL OFFER THIS MONTH:

£32

Computer Concept's

Graphics ROM

£27

AUNCH NEW THE INVESTIGATOR

Now you can make up back-up copies of all your

Discs. Put the precious originals away in the safe and use your duplicates.

See what your 8271 can do! With Watford's Investigator you can find out about track formatting, sector length, etc. Investigate your disc and then make up your back-up copy. Format your discs to your own individual specification! Find deleted Data! Spot unformatted tracks!

Disc based software includes a comprehensive

Price:£15

(Please specify 40 or 80 track when ordering)

ASM

Systems' Assembler in ROM. A complete program development package for Assembly Language Programmer.

Only £30

(Price includes ROM, Disc and Manual)

PENGO

The popular 100% machine code arcade game now at a special offer price of

Only £6.95

CRAWLER

A new challenge for your reflexes, exercise for your fingers. Crawler is the best yet BBC version of the popular arcade game "CENTIPEDE". Blast the voracious caterpillar before it eats you. Avoid the wandering spiders. Shoot the scorpions before they poison the mushrooms. Kill the descending fleas as they cause massive mushroom growth. This game is a delight to play. The controls are responsive and fast yet precise.

Only £5.95

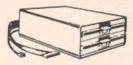
LIGHT PEN

A low cost Light Pen for BBC Micro.

Only £16

WATFORD-Always a step ahead

SPECIAL 'DISC DRIVE OFFER



MITSUBISHI DISC DRIVES

Cased, including Power Cable and Interface Cable. Plugs directly to BBC's Power Supply socket.

LCS400 Single 400K Drive LCD800 Twin 800K Drives

TEC DISC DRIVES

LCS 100 Single 100K Drive LCD 200 Twin 200K Drives

£119

BEEBPLOTTER

The Unique Graphic Tablet

Watford Electronics' BEEBPLOTTER will work with 32K BBC Micro. Connects to Analogue port. The unique design makes it accurate and simple to use. Attractively finished. The comprehensive booklet supplied describes its use in detail and shows some of the possible

The special features include:-

- * Works in all graphics mode and any colour selectable.
- Commands printed on Tablet and On-screen instructions.
- On-screen instructions.

 Special routines enable pictures to be quickly loaded from tape.

 Works with all operating systems and ECONET. Tape and Disc versions available.

 Large drawing area (32cms x 23cms).

 Maps, Pictures and Diagrams produced
- quickly and easily.
 * Transparent tablet enables maps and
- diagrams to be copied directly from books.

 * Commands include line, circles and
- rectangle drawings, infilling, full editing and an easy to use copy and move feature.

 * Screen dump routines included for Seikosha and EPSON printers.
- Routines are included to allow user to incorporate pictures in their own programs.
 Designed by a professional teacher with educational uses in mind.

ONLY £59 (£3 carr.)

SURGE PROTECTOR Plug

Safely eliminates dangerous voltage surges. During a thunderstorm, a nearby lightning strike can induce high voltage spikes in the voltage supply or fluctuating loads can also result in transient overvoltages which if unchecked, lead to expensive data unchecked, lead to expensive data corruption/loss. Our surge protection plug will provide the necessary surge protection. Simply replace your standard 13Amp mains plug with the surge protection plug (which is almost the same size). Ideal for computers, Hi-Fi systems, precision instruments, fridge freezers, etc. Max. surge current 2KAmp; Max. Voltage 250 Volts. surge current 2KAmp; man to a surge

GRAPH PAD

With this popular British Micro's Graph-pad, you can add new dimension to your computer enjoyment. It helps you to create your own application programs by the simple use of the Graphpad. Ideal for Educational use. Supplied complete with Cables, Manual and a two program cassette.

Price: £125

Continued .

BOOKS (No VAT on Books)

BOOKS (No VAT on Books	3)
30 Programs - BBC Micro	£3.25
30 Hour BASIC (BBC Micro)	£6.95
35 Education Programs for BBC	£5.95
36 Challenging Games for BBC 40 Educational Programs for BBC 100 Programs for BBC Micro	£5.95
100 Programs for BBC Micro	£6.95
Cassette version of above	E10.00
6502 Application Book	£13.95
6502 Assembly Language	
Subroutines	£14.25
6502 Software Design	£5.95
A young persons guide to BBC Basic	£4.50
Advanced Machine Code Technique	67.05
for BBC	17.95
BBC Micro	£12.50
Advanced 6502 Interfacing	£10.95
Advanced 6502 Programming	E12.45
BBC Micro	£7.95
Advanced Programming Techniques	
for the BBC Micro	£7.95
BBC Basic	£7.95
BBC BASIC	£5.95
BBC Basic for Beginners	£6.95
BBC Forth	
BBC Lisp	£7.50
BBC Micro An Expert Guide	10.00
Graphics	£7.95
BBC Micro Graphics and Sound	£6.95
BBC Micro Programs in Basic	10.90
Explained BBC Micro Revealed	£2.95
BBC Micro Revealed	£6.95
BBC Micro Assembly Lang. Prog BBC Micro Disc Companion	£7.95
BBC Micro in Education	£6.50
BBC Micro in Education Basic Programming on BBC Micro	£5.95
Creating Adventure Programs on	
BBC Micros	16.95
Has 36 graphics programs	£8.95
Creative graphics on BBC Micro	£7.50
Complete Programmer for BBC DISC FILING SYSTEM Manual	15.95
for BBC (comprehensive)	£7.50
Discover BBC Machine Code	£6.95
DIY Robotics & Sensors with BBC	£13.95
Easy Programming for BBC Micro	£5.95
Further Prog. for BBC Micro FORTH Programming Functional Forth for the BBC Micro	£5.95
FORTH Programming	£14.40
Games on your BBC Micro	£5.95
Games BBC Computer Can Play	£6.95
Graphs & Charts on BBC Micro	£7.50
Graphic Art for BBC Computer Graphs and Charts (Cassette)	£5.95
Graphics on BBC Micro	f6.95
Hobbit (Book and Cassette)	£14.95
Introducing the BBC Micro	£5.95
Introduction to FORTHIntro to Micro Beginners Book	£9.30
(3 Ed.)	£9.90
Let your BBC teach u to program	£6.45
LISP	
Logo Programming	12 45
Mastering CP/M	13.65
Micros in the Classroom	£4.90
Programming the 6502 Programming & Interfacing 6502	11.95
Programming the BBC Micro	£6.95
PASCAI	£9 25
Programming for Education on BBC	£5.95
Structured Prog. with BBC BASIC The Complete FORTH	f6.95
The BBC Micro Book, BASIC, SOUNI)
& GRAPHICS	£7.40
Using Floppy Discs with BBC Micro	£5.95
Using BBC Basic	10.95

ONLY THE BEST AT WATFORD

STOP PRESS

DOUBLE DENSITY BOARD FOR BBC

We are proud to announce the launch of our Double Density Board for the BBC Micro. The DDFS software that we supply is a version of our highly acclaimed standard 16K DFS for the BBC Micro. It will automatically tell whether a single or double density disc is being accessed, as well as allowing the option of reading 40 track disc on an 80 track drive. Now on your 80 track Double Sided Drive you will have 720K storage instead of the usual 400K and with higher speed than ever before (of course this is a BONUS at NO EXTRA COST).

same as single density Kit.

DATA RECORDER & ACCESSORIES

Top quality Slimline, portable Data Recorder for computer use. Mains/Battery, operated with counter DATA RECORDER CABLE
For our Data Recorder to BBC Micro
DATA CASSETTES Top grade C12 Data
Cassettes in library cases.

36p

ATTACHE CARRYING CASE for BBC Micro

These Attache Carrying cases are attractively finished in mottled antique brown leatherette. An ideal and very safe way to carry your BBC Microcomputer. Price: £12 (£2 carr.)

ADVANCE USER GUIDE for BBC MICRO Only: £12.50 (no VAT)

VOLTMACE'S DELTA 14 Hand-set

Price: 'Delta 14' Hand set £12.50

ADAPTOR MODULE £12.55

TRANSFER PROGRAM Tape £5.10

Disc £7.95

JOYSTICKS for BEEB

Two versions available:

SINGLE: Player type TWO Players type £7.00 each £12.00 per pair

PLINTH FOR PRINTERS



Keeps your desk tidy. Place the printer on the plinth and the paper underneath. Finished in BBC colour.

£10 (carr. £1.50)

PLINTH FOR BBC MICRO



Protect your micro from the weight of the heavy TV/Monitor. This sturdy plinth is attractively finished in BBC colour. Air vent slots have been provided to allow maximum air circulation. It can be used to support a monitor or a printer. The micro slides underneath comfortably. A must for every BBC Micro owner, specially for those who have to move/open their computer frequently.

Single Decker Double Decker £11 (carr. £1.50) £20 (carr. £2.00)

4 WAY MAINS DISTRIBUTION SOCKET



A highly versatile space saving solution when multi-power outlets are required. Can be wall or floor mounted. Ideal for Micro Computer and peripherals application. Prevents you getting a dangerous tangle of plugs and adapters.

Only: £9.50

TEX EPROM ERASERS

EPROMs need careful treatment to survive their expected lifetime. Rushing it could burn their brains out. So cop-out of this helter-skelter world; take it easy the TEX way and give your chips a well earned break. Cool, gentle and affordable. EPROMPT does it properly.

Two versions available:

EPROMPT EB – The standard version.
 Erases up to 16 chips. £30.00
 EPROMPT GT – Erases up to 28 chips. Has

 EPROMPT GT - Erases up to 28 chips. Has an incorporated safety switch which automatically switches off the UV lamp when the Eraser is opened. £33.00

Prices subject to change without notice.

MAIL ORDER AND RETAIL SHOP. TRADE AND EXPORT INQUIRIES WELCOME. GOVERNMENT AND EDUCATIONAL ESTABLISHMENTS OFFICIAL ORDERS ACCEPTED. CARRIAGE: Unless stated otherwise, please add 75p to all cash orders.

VAT: UK customers please add 15% VAT to the total cost incl. Carriage.

SHOP HOURS: 9.00am to 6.00pm. Monday to Saturday. (Ample Free Car Parking Spaces)

ACCESS ORDERS: Simply phone: Watford (0923) 50234. (24 Hours)

|||| | Watford Electronics

Dept. BBC, Cardiff Road, Watford, Herts, England. Telephone: 0923 40588/37774. Telex: 8956095

Part 14 of MIKE BIBBY'S introduction to programming

Type your PROC names with care, for a boob can drive you berserk

WE'LL start off this month by recapping about procedures. I know we mentioned some of this last month, but procedures cause some people headaches.

It's not that they're difficult, it's just that you have to keep looking somewhere else to see what the micro is doing!

Anyway, a procedure consists of several lines of code that you want to use repeatedly in a program. The idea is that instead of typing out virtually identical lines with just the line numbers altered, you call the procedure at relevant points in the program.

To do this you have first of all to define the procedure – that is, tell the computer what you expect it to do when you call the procedure.

The first step is to give the procedure a name, in much the same way as a variable.

- 10 REM PROGRAM I
- 20 MODE 6
- 30 REPEAT
- 40 INPUT"A word", word\$
- 50 PROCorint
- 60 UNTIL 0
- 80 DEF PROCprint
- 90 PRINT" "The word was "word\$"
- 100 ENDPROC

In Program I line 80 does this with:

80 DEF PROCprint

This tells the micro that the next few

lines are the "actions" it is to perform when it encounters a reference to PROCprint.

In this case it has only one thing to do — print out the word you had previously input. It's all rather trivial, but it illustrates the point.

At the end of a procedure we're defining we must include an END-PROC so the micro knows that that procedure is over (line 100).

What happens in Program I is that, as soon as the micro has the word it prompted for (line 40), it encounters line 50 which reads:

PROCprint

The micro looks to where PROC print is defined in its memory and carries out the lines of code it finds there until it meets an ENDPROC. It then returns to the program where it left off.

On the next occasion it meets a PROC print it will again carry the procedure out, and then continue from where it got up to in the main program.

Notice, it carries on from where it got up to. Enter this new line 30:

30 PROCprint:PRINT"I'm at the second part of line 30"

What we've done here is to put two statements on the same line – which we can do if we separate them with a colon.

If you run the program now you'll notice that after doing PROCprint it carries on from exactly where it left off, and does the second half of line 30.

It does not simply carry on with the next line. It's far cleverer than that.

Now for something else. Change line 50 to:

50 PROCPRINT

and line 80 to:

80 DEF PROCPRINT

then run it and see what happens.

You might have been expecting the BBC Micro to refuse to accept PROCprint since PRINT is a Basic keyword. After all, it won't accept a line like:

PRINT=6

or:

PRINTA=6

However you can get away with it in procedures, but I don't encourage it – sticking to lower case procedure names is far clearer.

Change line 80 back to:

80 DEF PROCprint

When you run it you'll get:

No such FN/PROC at line 50

which is right since the procedure now doesn't match up with its definition.

It's all too easy to do something daft like this when you're programming, and amazingly difficult to spot.

It is the sort of thing that infuriates people typing in listings. You see you might have typed in line 50 perfectly but mistyped the procedure name later on,

ARIES-B20

our BBC micro in five minu

Features

- * Adds 20K of useable RAM to your BBC Micro
- Run programs up to 28K long in ANY SCREEN MODE
- ★ Extra memory can be used directly from BASIC I and II, VIEW 1.4, FORTH, LISP, and many other existing programs
- ★ ARIES-B20 is compatible with all correctly written BBC Micro software, on cassette, disc, sideways ROM or cartridge
- ★ Don't be deceived: this product is unique - no other expansion unit has these capabilities
- ★ Complete compatibility ARIES-B20 uses only documented MOS facilities
- ★ Fitted in 5 minutes using only a screwdriver
- ★ Simply plugs in inside the case
- ★ No soldering or cutting
- ★ (Unlike some add-on products) will cause no damage to your

- BBC Micro can be removed at any time
- ★ Incredibly simple to
- ★ Patent applied for
- ★ Designed in Cambridge by BBC Micro experts
- ★ Top quality manufacture
- ★ Unquestionably the most important add-on ever produced for the BBC Micro
- ★ Top software houses are racing to produce the "superprograms" made possible by the extra capacity
- ★ 1 year guarantee.
- * Available mail-order only
- ★ Official purchase orders accepted from bona-fide educational establishments, all other trade cash-with-order

- ★ Price £99.95 including post, packing and VAT
- ★ If not completely satisfied with your purchase, we will refund your money in full providing you return the ARIES-B20 in good condition in its original packaging within 14 days

Machine requirements:

- * BBC Micro model B
- ★ MOS 1.2 or later
- ★ Plugs into CPU socket and 1 sideways ROM socket

Also available IEEE-488 interface. Coming soon: Compatible ROM expansion board.

How to Order.

Send cheque or postal order made payable to: Cambridge Computer Consultants Ltd and forward to:

Cambridge Computer Consultants Ltd, FREEPOST, Cambridge CB1 1BR. Telephone Cambridge 0223-210677

Please send me (Qty). ARIES-B20(s) at £99.95 (incl. p.p. & VAT). I enclose a cheque/postal order made payable to

Cambridge Computer Consultants Ltd for £.....

Name (block letters)

..... Post Code

Cambridge Computer Consultants Ltd, FREEPOST Cambridge CB1 1BR

Telephone Cambridge 0223-210677

From Page 43

where it's defined (or rather, it's supposed to be defined).

However the error message points to the line at which the procedure was called – not to the definition where your error was.

Of course the micro is right. There is no such procedure because of your mistyping and it can't guess what you intended to type.

Notwithstanding, it can still drive you berserk in the wee small hours.

So the moral is: If you get an error message in a line concerning a procedure don't just check that line, but have a look at where the procedure is defined as well.

Now have a look at Program II.

This does exactly the same as Program I but accomplishes it by passing parameters to the procedure.

In practice this means that the value of the variable held in brackets when we called the procedure – word\$ – is transferred to the variable in brackets in the procedure definition – in this case string\$.

We did much the same last month, except that we used numbers rather than strings. And we didn't put a variable inside the brackets of the calling procedure, we just put the number we wanted to pass to the procedure.

Now to continue our investigation of things that go wrong with procedures change line 80 to:

BO DEF PROCprint(string)

That is, leave the \$ off string\$.

When you run it you'll get the message "Arguments at line 50".

This isn't anything to do with your present mood. Arguments are the things within the brackets and they have to match up – strings to strings, numerics to numerics.

In this case you have deliberately set it up so that you're passing a string variable (word\$) to a numeric variable (string) and the micro doesn't like it.

Again, the error message points to line 50 where the procedure is called – although the "mistake" was actually in line 80, where it's defined. Take note!

You're not restricted to passing just one parameter to a procedure. Take a look at Program III.

Here there are two variables within the brackets of the procedure definition.

In this case one is a string which holds the word we want printing. The other is a numeric, holding the logical colour we want the text to appear on the screen in.

(We've changed to Mode 5.)

When you run it you'll see that the value of word\$ is passed to string\$ and shade is passed to colour.

It is important that you hand the variables over so that a string is passed to a string variable, a numeric to a numeric and so on.

To see this, alter line 90 to:

90 DEF PROCprint(colour, string\$)

and you'll get the message "Arguments at line 50".

This is because you are trying to pass

It is important that you hand the variables over so that a string is passed to a string variable, a numeric to a numeric...

values to variables of the wrong type. The micro takes the first variable from within the brackets of the procedure call and tries to pass it to the first variable within the brackets of the procedure definition.

It then tries to hand on the second variable within the call to the second in the procedure definition and so on. If they don't match up there are problems.

By now you won't need reminding that the line number in the error message might be a bit misleading.

Finally, have a look at Program IV. We've extended the parameters passed to include the line and column that the string you enter is printed at.

10 REM PROGRAM IV 20 MODE 5 30 REPEAT 40 INPUT"A word", word\$ 50 INPUT "Colour", shade 60 INPUT"Line",line% 70 INPUT"Column", column% 80 PROCprint(words , shade, line% ,coluanZ) 90 UNTIL 0 100 REM ========== 110 DEF PROCprint (string\$, colour ,x% ,y%) 120 COLOUR colour 130 CLS 140 PRINT TAB(xZ,yZ) string\$" 150 ENDPROC

I think you should see what's going on here without too much trouble.

Suppose, for some strange reason, that we want to input our parameters in Mode 6, and then change to Mode 5 in PROCprint. You'll need to change line 20 to:

20 MODE 6

and line 130 to:

130 MODE 5

When you run it you'll get "Bad mode at line 130". This is because you aren't allowed to change mode within procedures.

You'll be amazed how often you'll forget this. But at least the error message points to the right line, even if it isn't a model of clarity.

Well that's enough for this month. By now I hope you've got a feel for procedures — and the sort of mistakes you can make.

Next month we'll use procedures in more sensible programs. Not only that, we'll see how using procedures can actually help you to design your own programs.

UNREPEATABLE BARGAIN OFFER FROM MIDWICH ONLY WHILE STOCKS LAST!

1,000 BBC MICRO COMPATIBLE

DISC DRIVE UNITS

TO CLEAR



Includes connecting cable, DFS Manual and Formatting Disc.

We need to clear our stocks of brand new Shugart SA 410 Disc Drive Units, to make way for new merchandise in our warehouse.

Each 54" standard height drive has a 200K, single side, 80 track capacity and includes manufacturer's full warranty.

Cash with order only to include carriage at £3.50 per drive.

Telephone your credit card order now.

HURRY, OFFER ONLY APPLICABLE WHILE STOCKS LAST.



RICKINGHALL HOUSE, HINDERCLAY ROAD, RICKINGHALL, SUFFOLK IP22 1HH. TELEPHONE: DISS (0379) 898001.

AN 800K DISC DRIVE SYSTEM. A RECORD £

If you're upgrading your BBC Micro to a disc system, you can get unbeatable value from Opus.

For instance, you can buy an Opus 5800 drive with 400K single density, for only £259.95.

And for only £120 extra, we'll give you our new double density disc interface.

Specially developed by us, it effectively

doubles the capacity of your drive, giving you an 800K system for only £379.95. And that includes VAT and carriage.

Our Double Density Interface can be supplied with any of the disc drives listed below. And it is not available anywhere else except Opus.

To place your order, post the coupon or buy direct at our showroom.



OPUS 3" MICRODRIVE

Double Sided 40 Track Drive 1/2 Megabyte Unformatted.

- Twice the capacity on line of other available drives
 200K. Single Density 400K. Double Density
- Ex-stock delivery
 - 3 ms. access time
 - Lowest power consumption—direct drive
- Includes case, leads and utilities disc
- Totally compatible with 51/4" drives

Single Drive £229.95.

Dual Drive £459.95.

51/4" JAPANESE DISC DRIVES. SINGLE DRIVE

Opus 5401 Single Sided 40 Track - 250K. Unformatted. Formatted: 100K. Single Density, £179.95 200K. Double Density_

Opus 5402 Double Sided 40 Track-500K. Unformatted.Formatted:200K.SingleDensity. 400K. Double Density_ £229.95

Opus 5800 Double Sided 80/40 Track 1 Megabyte Unformatted. Formatted: 400K. Single Density. 800K. Double Density. £259.95 Opus 5802 Double Sided 80 Track-1 Megabyte Unformatted. Formatted: 400K. Single Density, \$279.95 800K. Double Density_

½Height •Includes case, leads and utilities disc

DUAL DRIVES.

Switchable 80/40 Track

All Dual Drives are metal cased with separate power supply.

Opus Dual 5401D. Single Sided 40 Track 200K./400K. on line_ £379.50 Opus Dual 5402D. Doubled Sided 40 Track 400K./800K. on line_ £459.95 Opus Dual 5800D. Double Sided 80/40 Track. 800K./1.6 Megabyte on line_ £499.95 Opus Dual 5802D. Double Sided 80 Track £569.95 800K./1.6 Megabyte on line.

DOUBLE DENSITY DISC INTERFACE

The ultimate Acorn compatible disc interface for your BBC micro.

 Utilities on ROM including: Format and verify, tape to disc transfer, automatic 40/80 track selection, automatic density selection, unique mass copy routine, powerful machine code operating system giving up to 248 files, 80% faster than

single density. Easy to install.	
Free user manual supplied.	£120.0

MONITORS.		
12" Green Screen		£89.95
12" Amber Screen		£99.95
Lead to connect to BBC !	Micro	£3.95
•Ex-stock delivery	• 24MHz Bandwidth	 Limited quantity

14" IVC Colour Monitor - Med. Res £221.89 14" JVC Colour Monitor - High Res £279.39

THE ORGANISER DESK.

- Top shelf for Monitor/Printer
- Large Desk Top Area
- Lower Shelf for Paper/Book Storage
- Teak Finish
- On Castors
- Self Assembly
- Ample room in front of the shelf for you to sit comfortably. Only £59.95

FLOPPY DISCS

3" Cartridges &5.75 each or &25.95 for 5.

51/4" Discs - with full 5 year warranty + free plastic library case.

S/S S/D £19.95 for 10 S/SD/D £23.95 for 10

S/S 80 Track \$29.00 for 10 D/S 80 Track £31.95 for 10

D/S D/D &26.95 for 10

8" Discs

S/SS/D &21.50.

S/SD/D &28.50.

D/SD/D £29.95.

GOVERNMENT & EDUCATION DISCOUNTS GIVEN. QUANTITY DISCOUNTS GIVEN. DEALER ENQUIRIES INVITED.

OPUS SUPPLIES LTD.

158 Camberwell Road, London SE5 0EE.

Opening hours: 9.00-6.00 Monday-Friday, 9.00-1.30 p.m. Saturday. 01-703 6155

9.00-1.30 p.m. Saturday.

Opus products are available from WHSmith, Spectrum, John Menzies, Allders and other stores.

ALL ITEMS ARE GUARANTEED FOR 12 MONTHS AND ARE SUITABLE FOR USE WITH BBC AND OTHER LEADING MICROS.

Quantity	Description		Price
he amount of &_	e for & y credit card account with ycard (please tick) No. is	TOTAL	
Name			

BBC MICR OMES OF AGE.

B-BASE:

£25.00

B-BASE is a very powerful and very flexible database program. Because B-BASE is designed specifically for disks there are none of the limitations found in most database programs, which are usually upgraded cassette programs. B-BASE is not limited by memory and even the disk limit can be overcome easily to provide an unlimited file size. Take a look at the features listed below and compare it with so called professional programs at up to £400, we think that you will be amazed. Why limit yourself to a 16K eprom

B-base contains approx. 30K of tightly compacted code.

Maximum File Size (40 track) - 99k & (80 track) - 199k.

Maximum Record Size - 2k: Maximum Number of Fields - 200:

Maximum Field Length - 254 chrs.

Options Include:

was Include:
WRITE - for adding records.
WORK - for displaying records, editing and deleting.
CALC - allows you to cope easily with fluctuating prices and VAT rates.
(works with whole file or search lists). Uses EVAL function allowing complex calculations to be performed, and the results to be displayed on screen or placed in a nominated field.
SEARCH - multiple function search on up to 5 fields.
OPTIONS: a) sort records found in search on 3 fields in assembling/descending order.

ascending/descending order (max records sorted is 500).

work search list, with edit and delete, save records found in search to disc. cl

d) load previously saved search list.
e) make a search list.

PRINTER - copes with parallel and serial printers and allows you to set up the printout + all printer codes allowed + allows you to join fields together and allows you to set them into columns etc. A label print

together and allows you to set them into columns etc. A label print routine allows single or double labels to be printed.

7) REDEFINE - allows you to transfer all records from old file to new file plus add or amend field or record size. No more re-entering all your data if you wish to add a field.

8) TRANSFER - allows you to transfer selected records between files.

9) NEW - allows you to define new file.

+ real time clock + many more features.

If you want a professional database for the BBC micro the β-BASE is your only option.

only option

Not compatible with Amcom DFS

REPLICA II:

£12.00

This is the one that everybody has been waiting for. The original REPLICA set a very high standard and many said that it could not be improved. The specification that we set our chief programmer included some supposedly impossible features. In fact ACORN state that some of the things that we have done are impossible, it just took us a little longer that's all. REPLICA II will transfer most of your cassette based programs to disk, even more than REPLICA did. Now when you buy disk drives you do not have to throw away your expensive cassette based programs. REPLICA II will transfer 'LOCKED' programs, programs loading as files, programs that load below &EOO, those with up to 6 sections and those up to &6E in length eg adventure programs. No more waiting for 6 minutes whilst your adventure programs load. REPLICA II is very easy to use and the user just enters a name, how many sections and whether CHAIN, *RUN or *LOAD is used to load the first section. Press play and let the program do the rest, even a menu. You cannot afford not to have a REPLICA II, think how much it will cost you to buy just 1 disk version of your favourite program — it is probably cost you to buy just 1 disk version of your favourite program – it is probably more than REPLICA II which will hold up to 16 programs, limited only by the disk capacity.

BEEBSYNTH: disk £11.00 cassette £8.00

A very powerful yet easy to use sound generating program that can be used A very powerful yet easy to use sound generating program that can be used by expert and novice alike. Up to 16 envelopes can be defined and saved. The envelope definer is very easy to use, control is through the cursor keys, and the effects of your changes can be heard immediately. When you have defined your envelopes press 'K' for Keyboard and the keyboard is trransformed into a musical instrument, but you control which instrument. Lets you play chords, not just single notes, change pitch and duration etc etc. A superb program that you can use immediately. Unlimited sounds at your disposal. Recommended by MICRO USER, PCN, HCW etc.

THE KEY:

£12.9

A disk utility program that provides the user with the tools to explore the disk environment and use it to its best advantage. The programs are:

Formats and verifies 40 track disks. Formats and verifies 80 track disks.

FORM80 BACKUP

- Allows backup copies of your valuable disks to be
- EDITOR
- Enables the user to read the disk sector by sector a to alter programs on the disk, even most protected an unlistable ones. More fun than any adventure game. Allows the user to recover data or programs that he been accidentally erased or damaged by a head crash

RETRIEVE

Every disk owner should have one, you will wonder how you ever managed without it. Recommended by WHICH MICRO, EDUCATIONAL COMPUTING etc. THE KEY' has been imitated by

many but bettered by none

JOYSTICK ÚTILITY:

£6.0

Converts non joystick programs to work with joysticks. Works with any program using INKEY (-) in Basic or machine code, to detect movement, which applies to most programs. The routine is relocatable and sensitivit the joystick can be varied. Compatible with

most games, including Acornsoft. Very easy to use, just press the keys you want to transfer. The machine code can be saved as a block of just 100 bytes. Supplied on cassette but can be transferred to disk

SHADOW:

£8.0

SHADOW is a tape cloning program that will enable you to make security copies of your own valuable cassette software. SHADOW works with 99 copies of your own valuable cassette software. SHADOW works with 99 of all known programs including those with sections at 300 BAUD and those that load as files. SHADOW will handle programs with any numbe sections and it will work with any of the current operating systems included. 1, 1.0, & 1.2. SHADOW is the definitive tape backup system and as a bonus you also get 'INSPECTOR' on the same tape. This allows you to vall areas of memory, search and alter bytes, etc. Colour coding helps to simplify memory usage. All this for just £8.00, I don't know how we do 'It is a condition of sale that this program is not used for piracy".

GRAFKEY/GRAFDISK disk £12.95 cassette £9.0

The GRAF' series of programs are, to our knowledge, the cheapest entry to the CAD (Computer Aided Design) field on the BBC micro. Input is by eif joystick or keyboard. All graphics modes can be used and altered whilst running, the functions provided are: Line, rectangle, triangle, circle, text (upper and lower case), paint and colour pallet (8 colours and flashing). Drawing aids include: Alignment grid, circle copy, delete, free memory, premory, variable cursor speed, clear screen and redraw. Save drawings to tape in about 20 seconds or to disk in about 2 seconds. Rubber Band is the colour pallet (1) and the very flexible line drawing facility and has to be seen to be believed. Pictu can be savedand included in your own programs, very easily. GRAFDISK also provides a screen save facility. Recommended by BBC MICRO USEF PCN, ELECTRONICS & COMPUTING, LASERBUG ect, used by university. colleges and business, as well as the enthusiast.

SINGLE KEY: (requires 1.2 O.S.)

£5.0

SINGLE KEY ENTRY provides the user with single key entry of all 66 keyworks on the BBC micro. Speeds up your program input, it's just like having 66 function keys and it only occupies 256 bytes. Compatible with BASIC 1 & BASIC 2.

EDUCATIONAL PROGRAMS

THE GARDEN:

£8.00

A series of three programs to help children with colours, spelling and recognition. The three programs cover three overlapping age ranges from recognition. The three programs cover three overlapping age ranges from bright four year olds to eleven year olds. The first level concentrates on colours and requires a simple Y/N answer to a question. The other two levels are orientated towards spelling and sentence structure. A sentence is presented with a missing word and the child is required to choose the correct word from a list and then type it in. Using this method each exercise involves a sentence, three words and picture/word relationships, all of which help to expand the child's vocabulary and understanding. Excellent graphics are used to reinforce the teaching. All three programs are provided on each tape and are compatible with disks.

COUNTING:

£6.00

Like 'THE GARDEN' this program uses good graphics to interest the child whilst engaged in learning. Various levels can be chosen with a maximum number of 20. Aural stimulation can be selected if required and allows the child to do the counting in various ways, it can even be done with eyes closed. The objects for counting are rockets that blast off, flowers which bloom, jack-in-the-boxes that jump etc, and are used to stimulate interest. Makes counting fun.

TAKE-1:

TAKE-1 is by John Sekula, the author of the acclaimed COUNTING program above. This new release concentrates on subtraction and again uses excellent graphics including sideways scrolling to gain the child's interest. Suitable for children counting up to 20 but the graphics are suitable for all. Recommended and praised by many teachers and parents. Give your children the start they deserve.

MATCHING:

£7.00

A bumper tape of four programs covering numbers, words, shapes and patterns. Graphics have been deliberately minimised to avoid distraction from the subject. They are ideal for infants and pre-school children. 'NUMBERS' provides various levels and alternative methods for counting. The space bar can be used as a counting stick and a visual and aural reward is given. 'WORDMATCH' again has various levels and the child is required to match the subject word with its partner which is in the displayed list. There is a choice of moving the word or moving the marker. 'SHAPE MATCH' can be of use to all ages and has a wide difficulty span. The cursor keys are used to move the subject shape onto the correct match and they will then merge if the answer is correct. 'PATTERN MATCH' is similar to 'SHAPE MATCH' but colour patterns are the subject instead of the geometrical shapes. This program introduces shape, colour and relational concepts and can even be of help in detecting colour blindness, although any patterns. Graphics have been deliberately minimised to avoid distraction and can even be of help in detecting colour blindness, although any suspicions should be confirmed by an expert.

INTRO:

INTRO is a simple computer programming language which uses the immediate visual response of 'turtle graphics' to introduce a number of programming concepts and techniques and to illustrate a variety of mathematical ideas in the areas of measurement, pattern, angle, and the use of variables. INTRO is similar to LOGO but with some important and deliberate differences. The most obvious is the screen layout which sets a section of the screen aside as a scratch pad with room for instructions to be displayed. Another important difference is in the way procedures are defined, in LOGO you must decide before typing in the procedure but in INTRO the current program can be stored as a procedure by typing STORE NAME, or whatever. INTRO has a very full instruction set, permitting great flexibility in handling graphics and in addition allowing access to the BBC's mathematical functions, INKEY etc. Programs and procedures can be saved to tape just like normal programs. INTRO is supplied with a comprehensive nineteen page manual as well as demonstration programs on the tape. INTRO can be transferred to disk but files must still be loaded and saved on tape.

HUE-MEN

Designed and written especially for pre school children this program is loved Designed and written especially for pre school children this program is loved and admired by everybody that sees it. It has proven a big hit with children and adults alike and no collection is complete without a copy of HUE-MEN. This program is the best example of animation in MODE 7 seen to date, yes MODE 7. We cannot praise this program too highly and it is actually educational too. The subject is colour and HUE-MEN succeeds in extending young children's attention span without the teaching element even being noticed. Recommended for children of all ages.

SHAPE-MEN:

SHAPE-MEN is by the same author as HUE-MEN, Phil Reynders, and uses similar concepts to aid in shape recognition. Again using MODE 7 and sound this program will extend the child's attention span considerably. A real must and both these programs are recommended by PRIMARY EDUCATIONAL SOFTWARE REVIEW

ALL educational software is supplied on tape - but can be easily transferred

CASSETTE LEADS

WITH MOTOR CONTROL

Electron cassette lead 7 DIN-3 Din + 2.5mm Remote Jack Electron cassette lead 7 DIN - 2* 3.5mm Jacks + 2.5mm Jack BBC cassette lead 7 DIN - 3 DIN + 2.5mm Remote Jack BBC cassette lead 7 DIN - 2* 3.5mm Jacks + 2.5mm Jack

£2.95 £2 95

VIEWpoint

£12.00

VIEW PRINTER DRIVER FOR EPSON FX80 Multi-page driver with print menu allowing

the setting of global (document wide) printer functions at printer initialisation.

1) Multiple choice of highlight options including underline, italics, bold, enlarged, proportional, condensed, superscript, subscript.

superscript, subscript.
Choice of any one of the nine language character sets held in the printer ROM.
Choice of PICA or ELITE type face.
Print intensity: normal or dark.

Single sheet or continuous printing. Slow (accurate line feed) or fast print

speed.
7) Choice of "PAD" character. Selection of "" as the PAD character switches off the backslash trap to allow full implementation of the foreign language character sets.

User Defined Character Definition
The print menu program also contains a sophisticated character generator which allows the construction of 95 user defined characters which are then accessible from

VIEW via a highlight option. The characters are displayed in an 8 × grid and can be printed (singly or as a set), stored, examined or changed at will. Supplied on disc with comprehensive

JOYSTICKS

BBC JOYSTICKS - Fully proportional joysticks in smart sturdy injection moulded cases. 1.5 metres of cable, long life mechanism gives precise operation. British £17.95

BEEBSTICK PLUS

BEEBSTICK PLUS - A high quality joystick as used by MEP's and SEMERCs.
Precise action and if you want to use a joystick for serious use then this is

PROGRAMMERS

We are constantly seeking new and interesting programs. Why not send yours for appraisal? You have got nothing to lose but much to gain - So why not send your program today? 40 track disc if possible or two copies on cassette. In some cases we will even provide disc drives against future royalties.

State 40 or 80 track when ordering discs.

NOTE: All prices are inclusive of VAT and postage - NO EXTRAS!



Patience is a virtue, but a machine code monitor is better

WHEN writing machine code programs most of us find that they don't always work properly first time. Debugging, however, is often a time consuming and arduous task, requiring more than a little patience. It is for this reason that a machine code monitor is a boon.

The monitor can be used to display the current contents of registers, execute subroutines, single step through programs and so on, so speeding up the debugging process.

Before using the monitor for the first time you must first CHAIN the define program (Listing I). This sets up the table of values for symbolic listing (disassembly) and its own break routine.

When prompted by 'RECORD then RETURN', find a suitable area on tape and save the data file as created by this program.

If you are using cassette I suggest that you save a copy of this data after the monitor itself because the monitor will look for this table when you run it.

In other words, the tape you'll be using from now on will contain Listing II - I suggest you save it as 'MONITOR' - and the data file created by Listing I, in that order.

On discs it is much easier as you don't have to bother about the order.

To use the monitor you have thus formed, load the machine code program to be tested.

Now set appropriate values of PAGE, HIMEM and so on to allow Monitor (Listing II) to be loaded and run without destroying your machine code (for example PAGE=&4000) to force the monitor into the top half of a 32k machine. Now simply CHAIN the monitor.

The 6502 has one instruction – BRK – with a value of 0 which acts like an interrupt. In BBC Basic this is used as the method of reporting errors.

In Basic I there is a bug in error message reporting which can be bypassed by writing a small machine code routine and planting its address in the break vector.

A machine code program will now perform the Basic ON ERROR action whenever it comes to a BRK instruction.

In our scheme of things this enters Monitor, which manages the planting of BRKs, displays values and so on. Monitor must co-reside in RAM with the machine code program being tested, but uses only Basic system variables.

The Basic interpreter uses page 0 locations, and page &600 for temporary storage of strings.

Whenever a BRK occurs the values of all the 6502 registers are stored in A% and B%. The stored values can be seen and changed if required in Monitor, and are restored to the registers when the machine code is re-entered by Step, Trace or Run.

Step and Trace plant BRK instructions at the start of the instruction (or instructions in the case of a conditional branch instruction) which follow the current one.

Thus Monitor will be re-entered after each instruction is obeyed. Run plants BRK instructions at locations specified in a Breakpoint List, and Monitor will be re-entered when the next one is encountered.

It is the user's responsibility to check that the location is the start of an instruction, and that the program will actually get there.

Up to 10 breakpoints may be active at the same time.

Monitor does not prompt, but waits for you to enter a command. This is a letter, or Escape.

Any unassigned key will cause the current state of the registers to be displayed and a return to the waiting state.

After a command, if a value is required a prompt is given. All values are entered in hexadecimal. The Delete key acts as usual.

Commands which effect permanent changes – A,X,Y,F – can be aborted by pressing Escape. Terminate the value with Return.

The List, Memory display and Trace commands – L,M,T – generate multiple lines of output. They can be interrupted at any time by pressing any key. Monitor will then await another command.

There are four forms of output – Current Status, List, Display and Help.

Current Status shows the values of the Program Counter (PC), A, X, Y and Flag registers in hex, the status of individual Flag bits, and the mnemonic form of the instruction at PC, for example:

PC A X Y F Flags Instruction 8000 08001FF NV..DIZC JMP &801F

Bytes	become	ċolour	print
00-1F	40-5F	Magenta	,,
21-7E		White	
80-9F	40-5F	Red	&
A0-FE	21-7E	Yellow	S
20		White	0/
A0		Yellow	1
7F		White	0s
FF		Yellow	,s

Figure 1: How the bytes are printed

List shows the value of the PC, the bytes forming the instruction in hex and characters, and the mnemonic form of the instruction:

PC Bytes Chars Instruction 8000 4C 1F 80 L* & JMP &801F

Memory display shows the value of the PC, and the 8 bytes from that address in hex and characters:

8000 4C1F804CE9BC40 E L" &@ L\$i\$< @"N

In order to display all 256 byte values as characters some of them are transformed to printing characters. To show this they are displayed in colour.

For printer output, the colour codes are turned into printing characters, as shown in Figure I.

Space and &7F display as graphic square and graphic parallel lines respectively.

Help displays a summary of the commands available.

System variables

- A% Saves registers and flags AXYF.
- B% Saves PC and SP.
- C% Address of m/c routine to resume user program.
- D% Address of instruction types and mnemonics for Disassembler.
- E% Address of breakpoint table.
- F% Start) address of segment of breakpoint table.
- G% End) in current use.
- H% Single-shot/Trace/List marker.
- 1% Various.
- J% Various.
- K% Various.
- L% First byte of current instruction.
- M% Address of BRK vectored m/c code.
- O% Prints marker (2- printer on, 3- printer off).
- P% PC.
- Q% SP (stack pointer).
- S% Address of current byte of instruction.
- U% Upper limit for Trace, Search (default value &8000).
- V% Value of operand and part of current instruction.
- W% Search pattern.
- X% Various.
- Y% Various.
- Z% Address of m/c search routine.

Commands

- A,X,Y,F Prompts for a 1 byte value and inserts it into the appropriate register. Displays current status.
- P Prompts for a 2 byte value and inserts it into the Program Counter (PC). Displays current status.
- E Resets the PC to its value at the current entry to Monitor.
- G Gets the address corresponding to the stack pointer and places it in the PC. Note that the user's machine code stack runs from an address one higher than this value to &1FF inclusive.
- B,C Set, clear breakpoint. Prompts for an address and inserts/deletes a breakpoint. Errors: "Already in" There is already a breakpoint at that address. "Not in breakpoint list" Attempting to delete a breakpoint which is not present. "Breakpoint list full" Try deleting some unused ones.
- D Displays list of current breakpoint addresses.
- L Prompts for a count, and displays the store as instructions starting at PC for the specified number of instructions. PC is updated to the latest address. L can be interrupted by pressing any key.
- M As for L, but store is displayed in hex and characters.
- W Prompts for a 1 byte value, and Writes it to store at the current value of PC. Increments PC by one, and repeats. To stop, press Escape.
- R Runs the machine code from the current value of PC. Monitor will not be re-entered until a BRK is obeyed. A breakpoint on the first instruction to be obeyed will be ignored.
- S Obey one machine code instruction at PC, then returns to Monitor and displays current status.
- Trace repeats S continuously until any key is pressed, or the next byte is not a valid 6502 instruction, or the upper limit address would be exceeded (see U). Note that an attempt to Trace into ROM will effectively revert to RUN, with no breakpoints set. Stop just before entering ROM routines and plant a breakpoint at the address where RAM code is resumed.
- Prompts for an upper limit address. This is used in several ways.
 When an instruction is displayed other than for the List command if the address of its successor (or either possible successor in the case of a branch instruction) is greater than or equal to U, a flashing U is displayed. This will cause Trace to Stop.

If the destination address in a JSR instruction is greater than or equal to U, the subroutine will be run at full speed, and Trace resumed at the instruction following the JSR – if the subroutine returns there.

- H Displays a summary of the commands.
- Q,Esc Resets the basic BRK action, and leave Monitor.
- V Prompts for a value and performs a VDU statement with that value. Monitor checks for and remembers VDU2 and VDU3.
- Prompts and displays the current search pattern of up to four bytes. This can be changed by deleting and re-typing if necessary. Note that leading zeros are ignored, for example Z?00010203 will search for the three byte pattern 010203. A minimum of one byte will be searched for. For example, Z?0 will search for a one byte pattern of 00.

If the pattern is terminated by Return, the search starts at the current value of PC. If by Escape, at PC+1. The pattern is compared starting with successive bytes until the pattern is found, or PC=U. PC is updated. To continue the search, type Z and press Escape.

Full listing starts on Page 153

WHATRESOLUTION FOR ONLY £230. (EX.VAT)



Our RGB high resolution colour monitors (580 × 470 pixels) sell for £229.95 (excluding VAT)—a saving of over £100 compared to other leading monitors of similar specifications.

That's a bargain we guarantee you won't see from any other micro retailer.

We've managed to acquire the sole distribution rights enabling us to offer these superb monitors at this unbeatable price.

And just because you're saving on price doesn't mean you're sacrificing quality. Here's what Personal Computer News had to say about our monitors.

"There is no doubt that the JVC range of ECM colour monitors is excellent value for money...there is no loss in quality of picture after long periods...remember as more and more resolution is available with new micros, the need for a better display will be that much greater."

For those who only require medium resolution we also have a model (370 × 470 pixels) at £179.95 (excluding VAT) which is equally excellent value for money.

Both units have a 14" screen and are suitable for the BBC Micro, Sinclair QL, Lynx, Oric, Apple, IBM, the

MODEL REFERENCE	1302-2 High Resolution	1302-1 Medium Resolution
RESOLUTION	580 x 470 Pixels	370 x 470 Pixels
C.R.T.	14"	14"
SUPPLY	220/240v. 50/60Hz.	220/240v. 50/60Hz.
E.H.T.	Minimum 19.5kv Maximum 22.5kv	Minimum 19.5kv Maximum 22.5kv
VIDEO BAND WIDTH	IOMHz.	6MHz.
DISPLAY	80 characters by 25 lines	80 characters by 25 lines
SLOT PITCH	0.41mm	0.63mm
INPUT: VIDEO	R.G.B. Analogue/ TTL Input	R.G.B. Analogue/ TTL Input
SYNC	Separate Sync on R.G.B. Positive or Negative	Separate Sync on R.G.B. Positive or Negative
EXTERNAL CONTROLS	On/off switch and brightness control	On/off switch and brightness control

Electron and most other leading micros.

And naturally there's a years full guarantee.

Another one of our commitments is to make certain we deliver your monitor by courier within ten days of receiving your order.

You can order by filling in the coupon below and posting to: Opus Supplies Ltd., 158 Camberwell Road, London SE5 0EE. Or by telephoning 01-701 8668 quoting your credit card number. Or, of course, you can buy at our showroom between 9.00–6.00pm, Monday–Friday 9.00–1.30pm, Saturday.

To: Opus Supplies Please send me:	Ltd., 158 Can	nberwel	Road, London	SE5 OEE.
Please send me:	High Pe	colution	Colour Monito	or(c) at
-	£229.95			n(s) at
	Medium £179.95		ion Colour Mo c.VAT).	nitor(s)at
	Connect	tion lead	(s) at £6.00 ea	ch.
I understand carria (N.B. A High Resolucosts £279.39. A Mand carriage costs	ution Monito edium Resolu	rincludi	ng VAT, lead, an	d carriage
I enclose a cheque	for£	Orp	ease debit my	credit card
account with the ar	nount of £_		_My Access/Ba	rclaycard
(please tick) no. is.				
Please state the ma	ke of your con	mputer_		-
Name				
Address	- 9		375	
		0		
			DU	IC
				100
		-		pplies Ltd.



Strategy's the name of the game as you try to out-think your Micro

Counters:

QUADLINE is a fascinating game of strategy where you try to out-think the micro. Compulsive in the extreme, it's guaranteed to keep the whole family wanting just one more go.

A sort of upright Tic-Tac-Toe, you have to align four counters horizontally, vertically or diagonally -

By GORDON KAY

before the micro does the same.

When it's your turn, you place your counter by using the < and > keys to move a cursor under the row you want.

Pressing the space bar will then drop

the counter down the new row until it reaches the bottom or comes to rest on another counter.

It's one of those infuriating games where the micro "sneaks up" on you. You're absolutely certain that victory is vours on the next move - then the micro

PROCquery

Prints the instructions on the first call of each running of the program. This is achieved by calling itself twice and resetting the variable Z% each time. It then allows you to choose the colour you play, the level of play and who Prints a string in double height characters. starts.

PROCbig PROCprintboard Prints the board and resets the variables to their start Inputs the player's move.

PROCinkey PROCcheckwin PROCmygo **PROCvalid** PROCshowwinner **PROCinit**

Checks all possible lines of play.

Makes the computer's move. Checks if a particular move would be beneficial.

Initialises the arrays and generates the user-defined

characters and envelopes.

Prints the decending counter.

Prints the number of counters left for play. Decides who has won or if it is a draw and prints a suitable

PROCawinner

PROCprintcounter PROCprintcountersleft

response. A simple delay procedure. Randomises each scan of PROCcheckwin.

PROCdelay PROCshuffle

DSCDRIV



THE OPUS SUPER 3 MICRODRIVE.

FOR USE WITH YOUR BBC MICRO.

For only £229.95 (and that includes VAT, and all the necessary leads) you can have an OPUS 500k double-sided disc drive. And remember 3" disc drives are fast becoming the standard for home and business use.

This is an even bigger bargain than it sounds. For you're getting a double sided drive at the price that other company's sell single sided drives for. It reads and writes to the disc cartridge from both sides, giving you twice the on-line capability of other 3" drives. And there's no need to flip the disc over!

STATE OF THE ART TECHNOLOGY FEATURING:

- · Easy to connect to the BBC Micro
- Compatible with most other makes
- Comprehensive manual
- Free disc cartridge
- · Format, verify and other utilities provided
- Double sided
- One touch cartridge load
- 3 ms access time
- Portable, compact and reliable
- · One year's full guarantee
- Totally compatible with 5¼" drives

TECHNICAL PERFORMANCE.

	Single Density	Double Density
Capacity	250K Bytes	500K Bytes
Recording density	4,915 BP1	9,830 BP1
Track density	100 TP1	100 TP1
Total number of tracks	40 (each side)	40 (each side)
Recording method	FM	MFM
Rotational speed	300 RPM	300 RPM
Transfer rate	125K Bits/Sec	250K Bits/Sec
Access time track to track	3 ms	3 ms
Access time settling	20 ms	20 ms
Motor start time	0.5 sec	0.5 sec

The Opus Super 3 Microdrive is now available from W. H. Smith's and leading specialist shops. Dual disc drives are also available for £460.

OPUS SUPPLIES LTD. 158 Camberwell Road, London SE5 0EE.

Opening hours: 9.00-6.00 Monday-Friday, 9.00-1.30p.m. Saturday.

5	01-701 8668
	01-701 8668 01-703 6155

To: Opus Supplies Ltd., 158 Camberwell Road, London SE5 0EE. Please rush me the following: (ALL PRICES INCLUDE VAT & CARRIAGE.)

Quantity	Description	Price
	Single drive(s) at £229.95 ea.	
	Dual drive(s) at &459.95 ea.	
	TOTAL	

Or please debit my credit card account with

My Access/Barclaycard (please tick) No. is.

Address

Telephone

From Page 53

spots what you've overlooked and you're defeated!

There are three skill levels. You can play the red or yellow pieces and either yourself or the computer can take the first move.

The main variables use long self explanatory names. For example, the winner flag is "someonewins". The exceptions to this are:

C%	General purpose par-
	ameter variable.
T%	General nurnose

counter.

X%,Y% Counters for B%(7,6). **Z%** Recursive counter and

intermediate counter. CO% Random number. LX%,OX% Cursor coordinates. Local counters a%,b%,c%,d% Carrier variable for

B%(7.6) Main board array. Y%(7) Array for the number of counters in each

column. X1%(5),Y1%(5) Used for tine check-

ing. X2%(7), Y2%(6) Used to vary the checking order each time round.

X%,Y%,A% Also used as the transfer variables to CALL.

Quadline listing

10 REM *** QUADLINE ***

20 REM *** (C) 1984 ***

30 REM ***MICRO USER***

40 #FX227,138

50 #TV255

60 ON ERROR MODE 7 REPORT

:PRINT " in line No.";ERL

:END

70 *KEYORUNIM

80 *KEY100LD:MINL.IM

90 HODE 2

100 PROCinit

110 REPEAT

120 VDU 23;10,32,0;0;0;

130 PROCquery

140 PROCorintboard

150 someonewins=FALSE

160 REPEAT

170 IF istart colour=2

: PROCeygo

:PROCorintcountersleft(2)

:istart=FALSE

180 colour=3

190 PROCinkey

200 colour=2

210 PROCeygo

220 PROCorintcountersleft(2)

230 PROCcheckwin (4)

240 UNTIL someonewins DR counters(1

250 PROCawinner (someonewins, counters)

260 IF someonewins=20you%=you%+1

ELSE IF someonewins=4me%=me%+1

270 UNTIL 0

280 DEF PROCquery

290 LOCAL query

300 CLS

310 SOUND 1,1,200,15

320 IF ZX(2COLOUR 7

ELSE COLOUR 6

330 VDU 19,2,1;0;19,3,3;0;19,9

,9;0;19,11,11;0;

340 PROChig("### QUAD LINE ###"

,1,21

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are in the July 1983 issue of The Micro User.

350 PRINT TAB(2,6) "By Gordon J. Key*TAB(6,7)*(C) 1984*

360 IF Z%=OPROCbig("In order to win this".0.10)

> :PROCbig("game you have to" .0.13)

:PROCbig("get four counters" ,0,16)

:PROCbig("in a horizontal,"

,0,19) :PROCbig("vertical or",0,22)

:PROCbig("diagonal row.",0

:PROCbig("Please press a key"

,0,30)

370 IF ZZ=0

:a=GET

: 27=27+1 : PROCquery

: ENDPROC

380 IF Z%=1

1A\$="Use the "+CHR\$ 34+"("+ CHR\$ 34+" and "+CHR\$ 34+">"+ CHR\$ 34

390 IF ZZ=1PROCbig(A\$,0,10)

:PROCbig("keys to position" ,0,13)

:PROCbig("the cursor under" ,0,16)

:PROChig("the required row" ,0,191

:PROCbig("and press space to"

:PROCbig("drop a counter."

,0,251

:PROCbiq("Please press a key."

.0.30)

400 IF Z%=1

:q=GET

: 7%=7%+1

: PROCouery : A\$=""

:ENDPROC

410 PROChig("Do you wish", 4,9)

420 PROChig("to play",6,12)

430 COLDUR 2

:PROCbig("RED",8,15)

: COLOUR 6

:PRINT TAB(8,18) "or"

440 COLOUR 3

:PROCbig("YELLOW ?",5,21)

450 REPEAT :q=6ET

:UNTIL q=820R q=1140R q=89 OR q=121

460 SOUND 1,1,200,12

470 CLS

: IF q=820R q=114 VDU 19,2,3;0;19 ,3,1;0;19,9,11;0;19,11,9;0;

480 COLOUR 6

490 PROChig("What level do you"

:PROChig("require, 1 to 3" ,3,61

500 REPEAT level=GET :UNTIL level>48AND level(52

510 SOUND 1,1,200,12

520 PROChig("Do you want me to" ,1,101

:PROCbig("start?",7,14) 530 REPEAT a=GET

:UNTIL q=890R q=1210R q=78 DR q=110

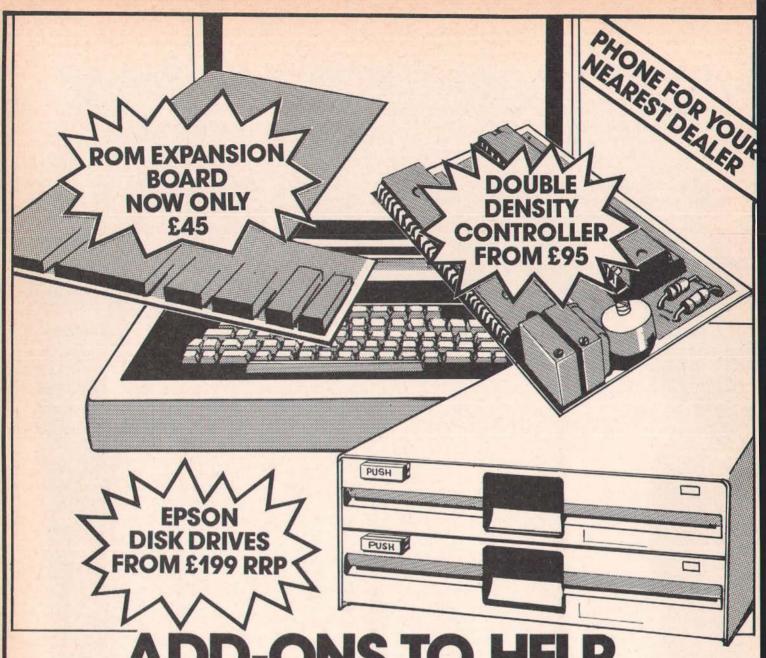
540 SOUND 1,1,200,12

550 IF g=890R g=121 istart=TRUE ELSE istart=FALSE

560 ENDPROC

570 DEF PROChig(A\$, XZ, YZ)

Turn to Page 136



ADD-ONS TO HELP YOUR BUSINESS TAKE OFF.

If you are thinking of upgrading your BBC Micro, it makes sense to get add-ons that not only bear a reputable name but also have been designed specifically to be used in conjunction.

EPSON,manufacturers of the world's best printers, now bring you the world's best drives, including the industry standard 3½ inch and 5¼ inch 40 and 80 trackunits.

These units are assembled in Britain by UDM for distribution through a dealer network.

All prices plus VAT

The Double Density Controller has been developed and manufactured by UDM specifically for the EPSON Disk Drives effectively doubling their capacity whilst maintaining compatability with

- second processors
- teletext
- OSWORD 7F.

Additionally, a sideways ROM expansion board has been developed that is fully compatible with the above.

Send for full details of range available and prices or ring for your nearest dealer.

EPSON

& UNITED DISK MEMORIES

Stanhope House Fairbridge Road London N19

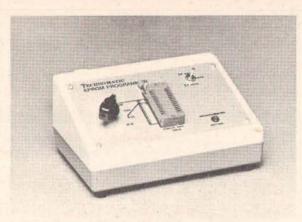
01-263 5026

TECHNOMATIC

BBC Computer & Econet Referral Centre 01-452 1500 01-450 9764 01-450 6597 Telex 922800

EPROM PROGRAMMER:

fully self-contained mains-powered eprom programmer housed in attractive finished case. It is able to program 2716, 2732/32A, 2764 & 27128's in a single pass. It is supplied with vastly superior software when compared to any currently available similar programmer. In addition to normal eprom programming, you are now able to load your favourite basic programs onto eprom.



The programmer comes complete with cables, software & operating manual. £89 + £2.50 carriage. Software on disc £2 extra.

- * Menu Driven Software provides user friendly options for programming the eprom with:
 - a) Basic programs.
 - b) Ram resident programs.
 - c) Any other program.
- Programmer can read, blank-check, program & verify at any address/addresses on the Eprom.
- Personality selection is simplified by a single rotary switch.
- Programming voltage selector switch.
- Full Editor with ASCII Disassembler, allowing direct modification of memory data in HEX or ASCII.
- Continuous display of time left for completion of programming.
- Continuous display of current addresses as they are being programmed.

EPROM ERASERS



UV1T Eraser with built-in timer and mains indicator. Built-in safety interlock to avoid accidental exposure to the harmful UV rays. It can handle up to 5 eproms at a time with an average erasing time of about 20 mins. £59 + £2 p&p.
UV1 as above but without the timer. £47 + £2 p&p.

SPECIAL OFFER EPSON FX 80 PRINTER ONLY £325

including BBC printer lead welve Months full warranty. Offer valid while

mart-mou

'TIME-WARP' REAL-TIME-CLOCK/CALENDAR

A low cost unit that opens up the total range of Real-Time applications. With its full battery backup, possibilities include an Electronic Diary, continuous display of 'on-screen' time and date information automatic document dating, precise timing & control in scientific

applications, recreational
use in games etc—its uses
are endless and are
simply limited by one's
imagination. Simply plugs
into the user port—no
specialist installation
required—No ROMS.
Supplied with extensive
applications software.
Please phone for details.
£29.00 + £2.50 carriage.



SMARTMOUTH:

The original 'infinite speech'. Still the best.

A ready built totally self contained speech synthesiser unit, attractively packaged with built-in speaker, AUX output socket etc.—no installation problems!

It allows the creation of any English word

It allows the creation of any English word, with both ease and simplicity, while, at the same time being very economical in memory usage. You can easily add speech to most existing programs. Due to its remarkable infinite vocabulary, its uses spread throughout the whole spectrum of computer applications—these include industrial, commercial, educational, scientific, recreational etc. No specialist installation—no need to open your computer, simply plugs into

the user port—and due to the simple software, no ROMS are needed. SMARTMOUTH is supplied with demo and development programs on cassette, and full software instructions. £37+ £2.50 carriage.

ELECTRON ADD ONS NOW IN STOCK

PRINT PORT

*Suitable for most centronics printers
*Supplied complete with lead
& programming.

£39 + £1.50 p&p

JOY PORT

- *Controls over 80% of available arcade games.
- *Uses ATARI Style 9 pin joysticks
- *Just plugs in—no soldering
 *Does not overload Electron psu
 £14.75 + £1.60 p&p



A professional range of Firmware/ Software to suit both the advanced programmer and the user. From the well known 'EXMON' and 'TOOLKIT' to the WORDWISE SPELLCHECK. Securitaria de Constitución de la constitución de l

MAIL ORDERS TO: 17 Burnley Road, London NW10 1ED (Tel: 01-452 1500, 01-450 6597 Telex 922800)

SHOPS AT: NW London: 15 Burnley Road, London NW10 IED (Dollis Hill

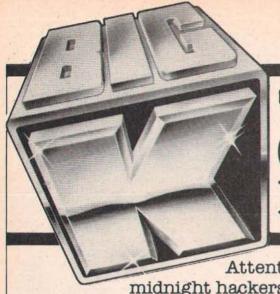
2 mins walk, ample car parking space)
West London: 305 Edgware Road, London W2. Tel: 01-723 0233 (Near Edgware Road

)

TECHNOMATIC LTD.

All prices exclude carriage & VAT. Please add carriage as indicated and add 15% VAT to the total order value. For fast delivery telephone your order quoting VISA or Access card or official order number.

(Minimum telephone order £5).



THE NEW COMPUTER GAMES MAGAZINE THAT BREAKS ALL THE RULES

Attention all you pixel-packers,

midnight hackers and binary-bustin' bozos! Gorf's gift to gamesville has just hit the streets. Big K's the name and Big K's the game it's a new magazine that's going to be music to your micros. Whatever Big K gets in its sights - technical, tactical or just plain old topical, don't expect anything typical. Big K plays it different and says it different. We're not afraid to shoot from the hip - and we're always hip when we shoot! We've a no-holds-barred approach to arcade strategy and adventure that'll have your CRT's tingling. Key in to Big K now for a magazine that puts news, reviews, programs and hardware under your fingertips. After your first byte of

Big K...the game will never be the same.

THIS ISSUE: Modem Living access the world through your micro and telephone - Big K makes the right connections.

• Win a full-sized BATTLEZONE arcade game in Big K's extravagant competition.

• What's all the fuss about? Big K examines the 68000 wonderchip.

Atari 800XL review.

 7 games programs for Commodore 64, Vic 20, BBC, Spectrum, ZX81, Oric, Atari.

 Atari graphics – read Big K's special feature.

Plus - Arcade Allev. dozens of games reviews. expert technical features, lots of fun and lashings of colour.



Third amazing issue on sale 17th May

Ask your newsagent for a copy - 85p

LORDS OF TIME

Joins our range of acclaimed pure-text puzzle adventures, at £9.90, for:

BBC 32K COMMODORE 64 SPECTRUM 48K LYNX 48K NASCOM 32K ORIC 48K ATARI 32K

ADVENTURE REVIEWS

"Adventures which have a fast response time, are spectacular in the amount of detail and number of locations, and are available to cassette owners . . Simply smashing!"

- Soft, Sept 83

"Colossal Adventure is included in Practical Computing's top ten games choice for 1983: "Poetic, moving and tough as hell."

- PC, Dec 83

"Colossal Adventure . . For once here's a program that lives up to its name . . a masterful feat. Thoroughly recommended"

- Computer Choice, Dec 83 "Colossal Adventure is one of the best in its class. I would recommend it to any adventurer."

- Acorn User, Feb 84

"Adventure Quest.. This has always been one of the best adventures for me as it seems to contain the lot. In all it took me about eight months to solve."

- PCW, 18th Jan 84

"To sum up, Adventure Quest is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you"

"Colossal Adventure is simply superb . . For those who want

to move onto another adventure of similar high quality, **Dungeon Adventure** is recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!"

- Educational Computing, Nov 83

ADVENTURE REVIEWS

"Colossal Adventure . . undoubtedly the best Adventure game around. Level 9 Computing have worked wonders to cram all this into 32K . . Finally **Dungeon Adventure**, last but by no means least. This is the best of the lot – a truly massive adventure – you'll have to play it yourselves to belive it."

- CBM 64 Users Club Newslette. "The puzzles are logical and the program is enthralling. Snowball is well worth the money which, for a computer program, is a high recommendation."

- Micro Adventurer, Dec 83
"Snowball . . As in all Level 9's adventures, the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denziens . . this program goes to prove that the mental pictures conjured up by a good textual adventure can be far more vivid than the graphics available on home computers."

- Which Micro?, Feb 84
"Lords of Time. This program, writen by newcomer Sue Gazzard, joins my favourite series and is an extremely good addition to Level 9's consistently good catalogue.. As we have come to expect from Level 9, the program is executed with wonderful style – none of those boring "You can't do that" messages!
Highly recommended."

- PCW, 1st Feb 84

MIDDLE EARTH ADVENTURES

1: COLOSSAL ADVENTURE

A complete, full size version of the classic mainframe game "Adventure" with 70 bonus locations added.

2: ADVENTURE QUEST

Centuries have passed since the time of Colossal Adventure and evil armies have invaded The Land. The way is long and dangerous; but with cunning you can overcome all obstacles on the way to the Black Tower, source of their demonic power, and destroy it.

3: DUNGEON ADVENTURE

The trilogy is completed by this superb adventure, set in the Dungeons beneath the shattered Black Tower. A sense of humour is essential!

THE FIRST SILICON DREAM ADVENTURE

1: SNOWBALL

The first of Pete Austin's second trilogy. The giant colony starship, Snowball 9, has been sabotaged and is heading for the sun in this massive game with 7000 locations.

THE LORDS OF TIME SAGA

7: LORDS OF TIME

Our congratulations to Sue Gazzard for her super design for this new time travel adventure through the ages of world history. Chill to the Ice-age, go romin' with Caesar's legions, shed light on the Dark Ages. etc.

Price: £9.90 each (inclusive)

Level 9 adventures are available from good computer shops, or mail-order from us at no extra charge. Please send order, or SAE for catalogue, to:

LEVEL 9 COMPUTING

Dept U, 229 Hughenden Road, High Wycombe, Bucks HP13 5PG Please describe your computer

ROM SOF

Caretaker £33.35 incl.

CARETAKER is a BASIC utility ROM which provides many new invaluable commands to help the BASIC programmer, Because CARETAKER is in ROM, it uses no BASIC program space and its commands are always instantly available. Some of the CARETAKER commands are detailed helow:

- *EXCHANGE · provides a search and replace facility, either global or selective. 'Wildcard' characters and BASIC keyword tokens may be included.
- *EXPAND Lists a program in an easy-toread form, also allowing 'squashed' programs
- *INSERT Enables BASIC routines on disc or tape to be inserted into or added to the program in memory.
- *KEYLOAD and *KEYSAVE Load and save the function key definitions.

Caretaker

*LVAR - Lists the values of all or some of the variables.

- *MERGE Will merge one or more BASIC programs on file into the program in memory.
- *MOVE Allows the current BASIC program to be moved to a new page in memory.
- *PARTSAVE Saves only a selected section of a BASIC program (useful for later merging).
- *RENUMBER Renumbers parts of BASIC programs and moves the renumbered section
- *RETRIEVE Restores a corrupted program to a form in which it can be listed and edited.
- *SINGLEKEY Enables BASIC keywords to be entered quickly, as on the ELECTRON.
- *SQUASH Reduces the size of a BASIC program in order to save memory space. A very efficient routine.
- *STATUS Displays the values of PAGE, HIMEM, program length, bytes free, etc.
- *TABSTOPS Provides a tabulation facility. Up to eight tapstops can be defined.

CARETAKER is supplied with a spiral bound manual, special 'single-key entry' stickers for the key fronts, and easy-to-follow fitting instructions. A full specification is available

CARETAKER 1.00 CURSOR (ON/OFF) EXCHANGE <old> <new> G/S (<length>) EXPAND (<start>) (<end>) INSERT <fsp>(line no>) KEYLOAD (<fsp>) KEYSAVE (< fap >) LVAR (F) (I) (S) (A) (P) MOVE <address> MERGE <fsp> (<fsp>) ... NORMALKEY NOTAB PARTSAVE < fsp> (< start>) (< end>) RENUMBER (<1st><inc><start><end>) RETRIEVE (<bytes>) SINGLEKEY SQUASH (S) (R) (M) STATUS TABSTOPS (< columns ... >)

New Release

MANAMAN

The Most Popular Word Processing ROM for the BBC Micro

WORDWISE is ideal as an introduction to word processing for the beginner, but is a powerful enough tool to be used seriously by professional authors (at least two of the most popular BBC Micro magazines are prepared entirely with WORDWISE). Being entirely ROM based it occupies none of the memory which is used to store text. It will operate fully on cassette, disc or ECONET (level II). It is not specific to any particular printer, nor does it require a special printer-driver (an expensive extra on some word processors). WORDWISE allows any codes to be sent to any printer, at any point within the text, by using a simple 'embedded command'.

For the beginner, text can be typed straight into WORDWISE and saved, loaded, previewed or printed immediately. Once experience is gained, commands may be added to control the final layout on paper. Some of the layout or 'formatting' commands are described later. At any time whilst the text is being entered or edited a word count is displayed continuously on the top line. Labelled function keys provide the user with simple controls to mark any section of text and then delete, move or copy it to any other position. Characters can be quickly converted between upper and lower case; changing case of entire paragraphs is equally simple.

WORDWISE Computer Concepts 1982 entire text new text marked text ESC Edit Mode Please enter choice_

Moving around the text is simple. Cursor keys alone move one position in any direction; CTRL and cursor keys together move in larger steps, a word left/right, a page up/down; SHIFT and cursor keys move as far as possible to the right/left of the line or to the start/end of the entire text. These movements are so easy to use that many other programs have adopted exactly the same method.

Formatting commands include the ability to split the document into pages of any length, with or without headings or footings. Page numbers may be printed automatically within the text, including within headings and footings. Commands are provided to set (at any point in the text) line length, left margin, tabulation positions, line spacing etc. Text can be centred on a line, indents and temporary indents can be set and cancelled. Output can be made to automatically pause at the end of a page, e.g. for a single-sheet feed. Right-justification of text can be turned on and off at any points in the text.

User-defined keys may hold any required string as normal and used within WORDWISE, including the codes required to induce key-operations such as cursor movement.

ARIES compatible WORDWISE

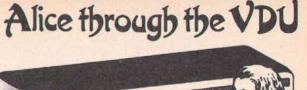
A new version of WORDWISE is available upon request at the standard price which is fully compatible with the ARIES B20 RAM board. When fitted alongside the compatible WORDWISE, the ARIES board allows text to be previewed in 80columns even with the normal RAM full of text. An upgrade from the standard version of WORDWISE is available. Please ask for details.

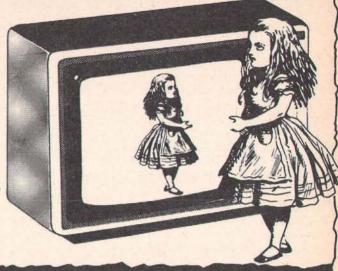






The Hobbit has a new collection of problems





Our monthly foray into Adventure games

AT last The Hobbit has arrived from Melbourne House for the BBC Micro. Read the book which is included plus the instructions and, unlike Bilbo, you are raring to go.

First time in don't bother with a map because you have to get a feel for the problems you will meet.

The first one is that Gandalf is as thick as a brick because he can't read the map. The second problem is that the only dwarf in the game is Thorin, who's as thick as two planks.

Then there's Oakenshield, who was always the most bloody minded of the mob. However he is cheaper to feed and, once you can arm him with a sword, he can be quite useful against Smaug.

Of all the creatures you can meet, the obvious target is Gollum in the Goblin's Cave. Unfortunately you won't be able to stumble around in the dark, like Bilbo, and just find the ring.

However if you don't get it then Smaug is going to prove rather more than a bare handful to kill.

On the first, quick pass I went through Rivendell, where Elrond proved, as expected, more literate than Gandalf.

I picked up the golden key in the mountains, reprovisioned at Beorn's, had a quick sniff at the Goblin Cave, was captured by an elf in Mirkwood and got killed trying to escape through the beer cellar.

Now for a listing and - real problems - the program fills the machine. I did start to get some Basic on the screen but when I tried connecting the line printer I couldn't repeat the trick.

Still, who needs it? After all the book tells you what you have to do and it's

quite fun to try things that you know you shouldn't, like KILL THORIN or, at least, try to - he's as mean and bad tempered as ever.

I long ago gave up trying to draw a map while playing because you always wander off the edge or become confused by twisty mazes. The best way is to recreate the two-dimensional array the authors used.

The Hobbit has 10 directions - N. S. E. and W (all of which you can input with the arrow keys), NE, SE, SW, NW, U and D. Lay out a ruled sheet of paper numbered down the left hand side like

For example, you can SAY TO ELROND "READ MAP" and he might refuse, so just hit the @ key to repeat the command and Elrond et al should do what you want.

Gandalf is the most awkward because he does tend to wander off and Thorin, who tends to stick rather closer to you, won't carry him.

One of the game's attractions is that there is no unique solution because it changes every time you play it.

You first notice this when waiting to get the key off the rolls at the beginning and, later on, Elrond will read different hints from the map.

N S E W U D NE SE SW NW Comments No. Location/objects

Hobbit hole/chest

Outside

In this way you can track and backtrack almost any trail and draw a neat map later on.

Another useful trick is to verify if an object exists somewhere. For example, try TAKE RING at the very start.

If the program replies I DON'T SEE IT HERE then you can be fairly sure there is a ring somewhere.

Next try TAKE XXXXXX and if the program responds I DON'T UNDERSTAND then you can be certain a ring exists.

However these are old tricks and the Hobbit presents some new, original features and problems.

In this game you must get the help of some characters to solve some of the problems and sometimes they can refuse to cooperate.

Also it is possible to get the congratulations message at the end of the game without scoring 100 per cent rather similar to that last point in Colossal Cave.

The idea of characters with independence is also not entirely new. Recall the psychopathic, axe wielding dwarves in Colossal.

But it is now far more subtle because of INGLISH, which allows you to make quite complicated commands.

This is such an attractive development that the implementation is frequently disappointing. You are tempted to try things that are still beyond the program's capabilities - like TIE GANDALF TO TREE WITH

From Page 61

ROPE to stop him wandering off.

To process such complex commands requires a program on a par with Terry Winograd's Block World Ph.D. project which he did some 10 years ago.

In Winograd's "game" there are (simulated) a number of coloured blocks, cones and boxes.

You could give commands like PUT THE BLOCK UNDER THE GREEN CONE IN THE RED BOX.

The program would then check the syntax of the command, then the semantics and then the feasibility of the command.

It may look simple but it isn't because what do you do if there are two blocks under green cones and a green cone already in the box?

The Hobbit has similar problems in that it has to do a lexical scan (recognise the words in the command), then a syntax check (roughly which words are verbs, objects, etc), then a semantic check (roughly, are the objects mentioned available and are the verbs applicable?) and then a feasibility check (can you put an elephant into a box?—it all depends).

These problems were very much in the field of Artificial Intelligence 10 years ago and are still only resolved in very limited, special cases.

The unique feature of the Hobbit is that it is based on the 1937 book by J.R. Tolkien. In fact this is my biggest criticism, because it really isn't a very good book — the only interesting characters are Bilbo and Gollum and their meeting is the only memorable part of the story.

Obviously the game is aimed – and very successfully – at children. It has already sold about 100,000 copies. But note that the next product from Melbourne House will be a Sherlock Holmes puzzle where you, the great detective, with the aid of a bumbling Dr Watson, will have to convince Inspector Lestrade – who will be even dimmer than Gandalf – who the murderer is and then catch the villain.

This sounds a lot more interesting to the more mature among us. But the idea of basing an adventure on characters in books has only just begun to be exploited.

I would like to see a black magic adventure requiring rather more knowhow than hammering stakes into vampires.

The best book in this genre is "The Devil Rides Out" by Dennis Wheatley, recently shown on television in a film version that missed out most of the interesting details.

The book is concerned with finding the Talisman of Set, an extremely potent object whose origin is not to be explained in front of the children.

The plot includes some very detailed journeys and a great deal of specific manipulation and incantation.

The hero would have to be the Duc de Richelieu but woe betide him – and you – if he doesn't know the last two lines of the Sussamma Ritual.

The appeal to me is that these lines are not given in the book because they can only be said when "the very soul is in peril".

One of the biggest problems of trying to implement book plots is what to do when the characters cannot, or do not, behave as they did in the original fixed story.

It is in this area that I found The Hobbit the most interesting. Every time you try an alternative to the book you are obviously taking a risk which will almost certainly (to make things easy) get you killed - try going through Mirkwood to the south of Beorn's house.

Nevertheless, with a bit of luck your demise is not always certain – there are two ways into the Goblin's Cave – and the story can take on a new dimension depending on the adventure writer's imagination.

Unfortunately, and probably because The Hobbit promises so many new, pioneering features, I found the game and implementation rather disappointing.

The characters are wooden, the commands still restrictive and the options still limited. Good ideas, but very difficult to implement satisfactorily.

One way of overcoming some of the problems is the MUD (Multi User Dungeons) concept which is only available, so far, in places which have a number of terminals linked to a large mainframe computer.

In this adventure system the people you meet are real but still as likely to mug and kill you.

An excellent account was published recently by Richard Bartle of Essex University. He describes a number of new features like extra rooms which can be added "on the run", so theoretically you can step from one adventure into another without realising it.

One of the interesting problems posed by this facility is the preservation of objects and characteristics you possess. At the moment all you can transfer is your knowledge of "magic" words.

This, although restricting, is totally impossible on micros until a master-slave operating system is available, but the concept should be a winner in micro computer clubs in a few years' time.

What you will be then able to do is really give vent to your murderous and/or amorous instincts. Computer dating should blossom as you, the frog, really do get to meet the sympathetic princess after the game.

The character that you develop in MUD is rather smililar to the D&D games – you can be weakened by hunger, fighting or have had too little sleep, but the longer you last then the more you know and the more powerful you become.

One of the ploys, according to Bartle, is to reach Wizard status and then pretend you are weak and ignorant.

When a novice attacks you, just blast him with a magic word. American hustlers will enjoy the practice.

Like Super User in UNIX – who can look at everyone's files, change them and even logout users – the Wizards can snoop on the other players, give them rubbish to carry, drop them into swamps and generally play havoc with the tinys.

It reminds me of the Magic Mode in Colossal Cave (not available in the micro version) when I could break their Ming vases, turn off the lamp and dump them in the Pirate's Maze.

After a hard day looking after the users it should be good therapy for responsible systems programmers.

Another possibility, which can now be exploited on a micro, is to build up a character through one adventure which can be saved, together with certain objects, strength, knowledge, etc, to attempt the next adventure in a series.

So far only the passwords – which are too easy to extract – have been used to go onto another adventure. But there are endless ways for the creators of these games to boldy entice you to buy the next episode.

Also this year you should be seeing the new generation of laser disc games where the (currently) crude graphics will be replaced by animated film clips.

However back to the present and The Hobbit. Full marks for ideas. It is full of Eastern promise and great for the kids, but if you are over 15 I suggest that you wait for Sherlock Holmes and mug up on Professor Moriarty.

Incidentally Holmes never did say, "Elementary, my dear Watson". But I'm sure the next program will understand.

C/WP Computers Willow House, Willow Place London SWIP LJH Telephone 01-828 9000



The ultimate in reliability. Approximately 12cps. Superscript, subscript and all WordStar features. Uses Silver Reed ribbons.

Tractor £103 Serial version £339

SILVER REED EX 43

Well known typewriter with manufacturer supplied centronics interface (I/F40). Serial version £379 Service available from 250 warranty centres.



18 cps, proportional spacing. Uses Triumph Adler daisywheels and IBM 82 ribbons, 2k buffer, Tractor £103



BROTHER HR15

Buffered daisywheel printer. Low cost tractor - £83 and sheetfeeder - £228 are available. Seriai or parallel.

RIBBONS

EXP 4/500 fabric £5 EXP 4/500 carbon £2 Brother £3 CP80 £5 EX 43/4 fabric £5 EX 43/4 carbon £2 Diablo/Qume £5 Epson 100 £5 Epson 80 £4 Juki £1 Star/Microline £2



160cps, user definable fonts and graphics. Serial version &429. 16k buffer £79. 32k buffer £109. 64k buffer £159. Special labels £5 or adjustable tractor £35.



100cps with adjustable tractor. Serial version £319. Buffers, cables and ribbons all available.

DAISYWHEELS

Diablo/Tec (UK Courier 10, Pica 10, UK Prestige Elite 12) 84 Qume (UK Courier 10, UK Prestige Elite 12) **£6**

Juki (10 and 12 pitch wheels available) £18

Silver Reed (UK Courier 10, UK Prestige Elite 12) **£10**

Brother (UK Pica 10, Prestige UK Elite 12) £18

ACCESSORIES

VIC 20/Commodore 64 interface & cable £49 Apple parallel interface & cable \$72 BBC cable £15 IBM PC cable £21 RS 232 cable £31

for £	and am ordering
101 &	and am or dorm's
Name	
Address	
	Telephone
*Delete where applicable. Pricable.	ces include cash discount, VAT and
12 months guarantee.	
Delivery charge \$9 (\$2 fo	or small, non fragile items)

THE BBC Micro is a very versatile beast. By virtue of its RS 423 port and Prestel-compatible graphics, it is well suited for use as an intelligent terminal to a variety of on-line systems.

All you need is a modem and some fairly simple software to connect your micro to a wealth of bulletin boards, databases and the various features of the Prestel system.

All these systems have their own characteristics, but I think one of the most interesting to use is the computer bulletin board system – often referred to as a BBS.

So what is such a system? The idea started in the USA, when a computer club decided that pinning messages for other members and notices onto a cork board on the wall was a bit too much behind the times for a high technology club like theirs.

They decided to hook a computer to a telephone and allow people with modems and micros, or even ordinary terminals, to dial in and leave their messages on the computer instead.

As modems were even then priced within the reach of the hobbyists in the USA, the idea was very successful.

It was soon taken up by other clubs and also by individuals, with the result that today there are at least 1,000 public and private BBSs operating in North America — and probably considerably more.

Since those early days the software that controls such systems has developed enormously and you can run a BBS on most of the popular micros available in the USA.

British BBS software is virtually non-existent as yet, but some programs are being developed.

Bulletin boards will allow callers to do a wide range of things, but the main emphasis is still on the traditional message and mailbox facilities.

For example, on most BBSs messages can be private or public, general interest or collected into special categories.

They will tell you if you have a message waiting when you call, and also let you search for messages on a particular subject.

Other features that you will find on a BBS include information and news files, help for inexperienced users, software to download, games and diversions, commercial sections and even advertising.

The reason I prefer using bulletin boards to Prestel or Micronet, which are the other systems readily available to the home micro user, is that they provide a very interactive type of environment, completely different in

Pass on messages via the micro's bulletin board

character to viewdata systems such as Prestel.

With a BBS you are always able to respond to the information on the system.

If you see something that interests you, you can leave a message about it, either to the originator of the item or to anyone else who calls the system.

In fact exchanging messages is really what BBS are all about.

There will always be a good bit of straightforward information on such systems, but it is usually there in a secondary role. For example there will probably be:

- Information about the system itself and how to use it.
- Information about particular subjects in the special interest sections.
- Files you can download into your own micro.
- Telephone numbers of other systems

But unless the system has a particular

By PETER TOOTILL

theme of its own, you are unlikely to find much information of general interest on it.

If you are looking for train times, weather reports, financial information, hotel bookings and suchlike the large commercial systems such as Prestel are the place to go.

There is, of course, a certain amount of overlap between Prestel systems and BBS. You will find some news about the micro scene aimed at BBC users on Micronet and Viewfax 258 on the Prestel system, and also on some BBS.

But on the whole the Prestel systems are very much more one way. They do have response frames, or places where you can leave messages to the operators of the database concerned, but they don't normally have the public message areas that BBSs have.

The other advantage of BBS is that they are open to anyone with no subscriptions or membership, and are free of charge (except for the cost of the phone call).

On the other hand ordinary Prestel will cost you £5 a quarter (+VAT), and Micro Prestel (which has the software and some other features from the Micronet system on it these days) is a further £8 a quarter.

However most people can get Prestel with a local call, which is something that cannot be said for BBS. A long distance call can soon chalk up a couple of quid.

The BBC Micro user is fortunate in that he is not limited by his computer as to the systems he can use. Both BBS and Prestel are easily available, given the appropriate modem and software.

So if you are choosing a modem my advice would be – if you can possibly afford it – to look for a multi-mode type that will allow you to use both V.21 (300 bit/sec – most BBS) and V.23 (1200/75 bit/sec – Prestel) systems.

The same applies to software. Buy a terminal program that will enable you to use both systems, but remember that to use both you need the right modem AND the right software.

There's no such thing as software that will allow you to use a V.21 system via a V.23 modem, or vice versa.

Happy communicating!

Standard RS 232 settings for use with on line systems:

7 bit word (excluding parity bit)
Even parity

I stop bit
Alternative settings that should work with most BBS:

8 bit word No parity I stop bit

I recommend that you use the second setting, as most terminal software just ignores parity anyway, and it will normally work satisfactorily.

It also gives the added possibility of transferring binary data using standard CP/M protocols or XMODEM protocols which give error free file transfer — and which aren't just for CP/M systems.

061-456 4157 -that's the number to ring for the Micro User's bulletin board

FROM now on The Micro User is only a phone call away from your own computer. Microweb, our bulletin board for BBC Micro owners, is up and running - and waiting to hear from you.

At the moment we're still growing. But these are some of the things we're planning you'll be able to do when you access Microweb:

- Leave messages for The Micro User team of experts.
- Have your program queries answered.
- Read the latest news about developments in the BBC Micro world.
- Download software directly into your BBC Micro.
- Discover what you be able to read in future issues of The Micro User.
- Tune in to what other BBC Micro users are thinking.
- Order back numbers, tapes and other products from The Micro User.

All you need is a 300 baud modem and suitable software - the Commstar/Grapevine combination, this month's special offer on Page 67, is ideal.

You'll also need to know our number:

61 - 456 4157

It's a 24 hour service. So if you've already got a suitable modem log on NOW to what promises to be the liveliest breadboard around!



THE PROFESSIONAL ONE PRO STICK

Century Systems in conjunction with S.L.M. are proud to present our 'PRO JOYSTICK'. Now available for use with the BBC computer.

Self centring stick unit, housed in integral moulded two tone blue-case. Ergonomically designed. May be hand held or desk mounted. Precision pot's tested to 1 million operations.

All metal bearings for silky smooth operation. Supplied with cable and plugs. Connects to the analogue port. These sticks have been supplied to industrial and government users, world wide.

> Don't confuse these with cheap units. For the serious user these sticks are a must.

OPTION ONE:

STANDARD UNIT: Has 2 axis stick and side mounted fire button

OPTION TWO:

2 axis stick with fire button mounted in the knob 3 axis stick with side mounted fire button, third axis is operated by twisting

stick top. See illustration above. Ideal for precision graphics use. £31.95

Mail order distribution:

CENTURY SYSTEMS 111 GRETTOM ROAD WINCHCOMBE **CHELTENHAM GL54 5EL**

TEL: 0242 602280 Access and Visa welcome

S.L.M. ENGINEERS **CHILTERN ROAD PRESTBURY** CHELTENHAM

Manufactured and supplied by:

Trade enquiries welcome

PHONE 0242 525488





Price

£24.95

DO you remember those incredibly exciting days when you first got your hands on a BBC Micro? The hours of fascinating discoveries, all night sessions, the slipping home early from work for a quick play...

I can remember all too well those heady days. However recently the excitement seemed to have gone from my micro activities – until I discovered Commstar, the new communications ROM from Pace.

What Commstar does is to allow your micro to talk to other computers over the telephone system via a modem – more of which later.

It's a very versatile and complex piece of software, but getting started couldn't have been easier, as the manual is very clear.

I had the number of Microweb – The Micro User's bulletin board – and decided to contact that.

First of all I entered Commstar with *COMMSTAR, then chose "Chat mode" by pressing C when the options page came up.

The screen cleared leaving just a clock ticking away at the top right-hand corner. A nice touch that, obviously to keep the phone bills down.

All I had to do then was dial up Microweb and when I heard the whine of the answering carrier signal I simply connected my modem and away I went.

You see, Commstar is set up to talk to the many bulletin boards springing up around the world with the minimum of fuss. It has the correct speed of transmission – 300 baud – and has all the parity bits and whatnot set for it.

Once I'd got through to Microweb all I had to do was answer the questions it asked me and we were really chatting!

I could talk to the Sysop – he's the chap who runs the board – browse among the news and messages left by other callers, and even download programs.

As you'll find when you log on to a bulletin board, you have access to masses of information and it would be nice to be able to save it all to scan at leisure when the phone bill isn't ticking up!

Commstar allows you to do this, because it's got an in-built buffer where you can store all the messages you're receiving.

All you have to do is to type B. The incoming data, together with your responses, is stored in the buffer.

The buffer size varies because you can choose to display the screen in

Let your micro do the talking

Put the zest back into your computing with this communications package, says JANE McDERMOT

Mode 7, which gives you 40 columns and a buffer of over 20k, or Mode 3, which gives you 80 columns but only about 9k of memory.

Once you've got what you want in the buffer you can save it with the S command, examine it with V or print it out. In fact there's a print option (P) that will let you print out the whole of the goings on.

After I'd got used to talking to the Sysop, I decided to try downloading some messages – an option the bulletin board offered.

I'd forgotten to turn on my buffer, but fortunately Commstar turned it on for me and I was able to view it later with V.

It occurred to me that some downloaded files might be longer than the buffer, but a quick look at the manual soon cancelled those fears.

Apparently there's something called the XON/XOFF convention which, if the computer you're talking to is being sensible, stops things "overflowing". Commstar lets you turn this on if necessary.

If, like me, you're lucky enough to have a disc drive, you can bypass the buffer and store things directly on disc. So downloading is a doddle – just press D for discs.

In fact, you can store the whole proceedings on disc by choosing discs with D and opening the buffer with B.

So far I'd been working with the default characteristics of Commstar. However the manual showed me there was a whole range of other possibilities.

For instance you can vary the speed at which the data is sent – the baud rate – and you can also fiddle with the format of the data.

Apparently different computers require their data serving up in different ways – something to do with parity bits and stop bits.

Anyway, Commstar makes tailoring your BBC Micro to suit other computers child's play. Just press I and you're given a menu of options to choose from.

You can also specify the rate you want data transmitted and the rate you expect to receive it – they're sometimes different.

There's even an option so you can load from disc the requirements of the computer you want to talk to – apparently they're called protocols.

Anyway, by now I was feeling adventurous, and I'd discovered another Beeb owner called Robin who also had a Commstar, so we got together to transmit programs.

First of all, just to really test the system, we picked a non-standard set up from the table (option 6 – 8 bit word, even parity, one stop bit) and then we chose baud rates.

Now 1200 baud is a fairly fast way of transferring files, so I set my send rate to that. Robin, who was receiving the file, set his receive rate to that too.

Then all he had to do was open his buffer, press F, and tell his micro he was receiving. In the meantime I'd loaded the program I wanted to send into my buffer, pressed F and told Commstar I was sending. We both connected our modems.

Now pressing F causes the micro to receive and transmit any kind of data – Ascii, Basic or machine code files – in a way that's virtually guaranteed to survive the vagaries of the telephone system intact.

In no time at all Robin had my program and was up and running it. Then he sent one of his back to me. Again we used 1200 baud, so I set my receive rate and he set his send rate to 1200.

I used the disc option, so as I received his program – after pressing F and telling Commstar I was receiving – it was automatically spooled onto disc under the file name I'd been prompted for.

Now the modem I'd been using throughout my experiments was Grapevine, which is produced by the me people behind Commstar, so it's t surprising that the combination rked so well together.

The attractively designed modem has sh buttons which let you set the baud e for transmission. Now the options lered are 300 baud RX/TX (receive/transmitting), and 1200/75 baud her way round.

It was the 1200/75 option that Robin d I had used to transfer programs. hen I was transmitting at 1200 he had set his transmit rate at 75. Also I ected 1200TX/75RX on my Grapele and he used 1200RX/75TX on his. hen he sent stuff to me we reversed the tings.

We could have avoided all the fuss if 'd just stayed at 300 RX/TX, but 00 is far faster and anyway it's a lot sier than it sounds.

In a perfect world we should have en able to transmit at 1200 RX/TX t Grapevine, in common with most ner modems, doesn't have this facility it's something to do with the andwidth" available over the teleone network.

The 1200/75 is a compromise – the e that Prestel has also chosen. And at brings us to another feature of pmmstar.

All you have to do is to press the hash y and your micro is automatically set as a Prestel terminal.

I have a friend who's a Micronet ember — apparently that's part of estel — so I "borrowed" his account mber and rang in.

I could easily become addicted to estel. With Commstar's aid I was able explore it thoroughly. It's a real rren, full of all sorts of goodies.

I'm still exploring the possibilities of Grapevine/Commstar combination fortunately the manual is extremely ar and full of useful advice.

One future project involves the tton on Grapevine that will allow me use Bell frequencies, the sort they use the States. Apparently there's a vast nount of activity over there that I end to investigate.

I've already logged on to a bulletin ard in Sweden and, if my bank count is up to it, I'm definitely going become more international.

All in all Commstar plus Grapevine s really added a new dimension to my mputing activities.

If you're looking for a new and citing micro experience, my advice is invest in this winning combination — u won't regret it.



= your entry into the exciting world of telecomputing!

EVERYONE at *The Micro User* is convinced that communications is going to be the fastest growing field in micro-computing.

We want our readers to be in at the forefront of the new technology. So we're offering a unique starter pack.

For a limited period only we can provide you with the superb Commstar/Grapevine combination from Pace – all that's needed to give your micro amazing communications power – for the unbeatable price of £125!

Commstar is a sophisticated piece of ROM-based software that instantly turns your micro into a terminal.

It will allow you to access micros all over the world – and it couldn't be simpler to use!

Not only that, at the press of a key, your micro will be set up for Prestel.

Grapevine is the modem designed to complement Commstar. It is ideal for making use of Commstar's many

exciting features.

The modem not only allows a comprehensive variety of baud rates, but also includes the Bell standards, allowing

you to log on to American computers!

At The Micro User we're very impressed with this matched pair, and we're sure you will be too.

This winning combination will open up for you the vast world of communications – and more cheaply than ever before.

Make sure of yours today!

The normal retail price for the Grapevine/Commstar package is £ 159.85
This special offer saves you £34.85!

of £125 each (includes VAT, po	
☐ I enclose a cheque/PO for Database Publications Ltd.	£ made payable to
☐ I wish to pay by ☐ Access ☐	Visa
No	expiry date
Signed	
Name	
Address	





MAKE THE BBC COMMUNICATIONS.

The BBC Micro is unbeatable when it comes to holding your attention. But when it comes to talking to the rest of the outside world it's virtually speechless.

Until, that is, you speak to us.

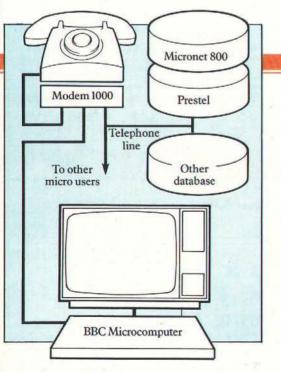
In which case you and your BBC could soon be accessing viewdata systems throughout the country.

By simply linking your BBC into our purposedesigned communications and viewdata system you dramatically increase the capability of your micro. Allowing you to keep in touch with your friends. And to get answers within minutes to electronically mailed letters. You can even try your hand at the latest adventure games on Micronet 800 (as well as looking at the news, reviews, prices and best-buy information).

In addition to all this, you will also be able to access Prestel. A vast database of news and information. Helping you to book tickets for your favourite concerts. Plan your road and rail trips. And even check the weather forecast before you go.

Our communications and viewdata systems open up the world to you and your micro. And at a downto-earth price – with systems starting from under £90.

So, if you're keen to contact the outside world... simply contact us.



with telecommunication systems
run by British Telecommunications
in accordance with the conditions
in the instructions for use.

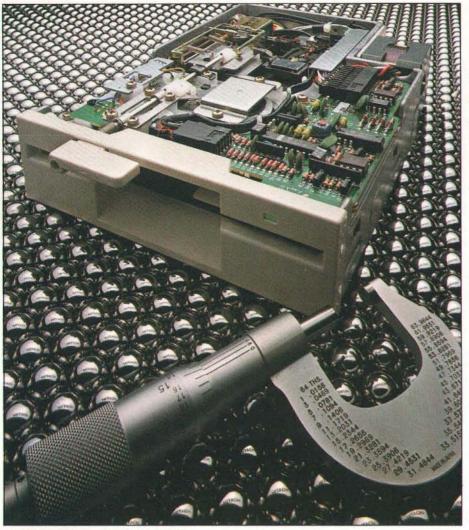
Prism Business Systems Ltd. Prism House, 18-29 Mora Street City Road, London ECIV 8BT Tel: 01-253 2277



APPROVED for use

	orther details of the Prism come for the BBC Micro.	nunications and
Name		
Address		
	Tel:	
	101.	BMU AP

HI-TECH MEANS HITACHI.



If you thought that all Floppy Disc Drives were alike - you'd be mistaken.

The HITACHI range stands out

- * High in reliability
- * Technically advanced
- * Fully compatible with BBC Units.
- 5¼" All 5¼" drives are half height and have an access track of 3 or 5 ms.
- 3" Amazing new 3" drive with hard case diskette, fast 3 ms track to track.

All drives have a 12 month warranty.

Code	(Uncased)	Price inc VAT
HF 001	3" single sided 100/200K	140.00
HF002	3" double sided 200K	163.00
HF 004	5¼" double sided 200K	178.00
HF 005	5¼" double sided 400K	203.00
	(Cased with leads	
	& Utility discs)	
HF 008	3" single sided 100K	165.00
HF 009	3" double sided 200K	189.00
HF010	51/4" double sided 200K	204.00
HF011	51/4" double sided 400K	229.00
HF 020	Separate leads (per set)	16.10
HF 021	Separate metal case 3"	9.00
HF022	Separate metal case 51/4"	9.00
HF025	3" diskettes	4.95 each
	(Cases match the BBC)	

Dealer enquiries welcome and Quantity prices available, All goods sent overnight carrier (add £6 to order for drives, Add £2 to order for leads or cases).

ALSO AVAILABLE FROM:

Made with you in mind.

RMK Electronics Limited Hinton House New Milton Hants (0425) 616110

Micro Choice 159 Havant Road Drayton Portsmouth Hampshire (0705) 324934 Silicon Valley Computer Centre Suite 104-105 16 Baldwins Gardens Holborn London (01) 242 2803 Wiltshire Microcentre Unit 6 General Trading Estate Signal Way Swindon, Wilts SN3 1PD (0793) 612299

ORDER FORM

CODE	QUANTITY	PRICE
HF001		
HF002		
HF004		
HF005		-
HF 008		*
HF009	*	9.5 0
HF010		
HF011		
HF 020		
HF021		4
HF022		
HF025		
ALITACI	Add Carriage	

Total

To: GSL Computing	I td.	Westport	Way.	Andover.	Hants SP103	3SG
-------------------	-------	----------	------	----------	-------------	-----

Name	
Address	
Phone No.	
I enclose cheque/PO fo	or £
Signature	
	Westport Way Andover, Hants SP10 3SG (0264) 59633
Computing	



Epson Fx 80 Printer

Including lead for BBC. Send £399 to include VAT, p&p.

200K

40 Track Single & Double

Disk Drive (Mitsubishi)

62 file names including cable and power lead. Send £215 to include VAT, p&p. inc. formatting disk & manual. 800K & 800K switchable with power supply available - ask for details.





800K Disk Drives

800K & 800K Switchable 124 file names including cable & power lead. Send £490 to include VAT, p&p. Send £499 for 800K Switchable.

Sanyo/BMC **Monitors**

12 amber or green screens. Send £110 to include VAT, p&p.





Diskettes

Memorex, in packs of 10 SS 40tk.....£18.00 DS 40tk.....£23.00 SS 80tk.....£26.00 DS 80tk.....£29.00

MICROWARE Unbeatable for price & service

400K Disk Drive 80 Track Single & Double

124 file names including all necessary leads. Send £399 to include VAT, p&p. inc. formatting disk & manual.



Juki Daisywheel

Printer

£346

18 CPS including cable. Send £399 to include VAT, p&p.

Epson Rx 80 FT Printer





£260



Disk storage boxes..... £17.00 (takes 35) Disk storage boxes..... £25.00 (takes 80) Prices include VAT, p&p.

Accessories BBC Stands.....£15.00 Dust covers.....£5.60

(for BBC, Drives and Printers)



Product		Price	Qty.	Total
200K DISK DRIVE		£215.00		£
400K DISK DRIVES		£399.00		£
EPSON FX 80		£398.00		£
800K DISK DRIVES		£490.00		£
800K SWITCHABLE	. 🗆	£499.00		£
JUKI PRINTER		£399.00		£
SANYO BMC-AMBER		£110.00		£
SANYO BMC-GREEN		£110.00		£
EPSON RX 80 FT		£299.00	1	£
SS 40 DISKETTES		£18.00		£
DS 40 DISKETTES		£23.00		£
SS 80 DISKETTES		£26.00		£
DS 80 DISKETTES		£29.00		£
BBC STAND		£15.00		£
DUST COVERS		£5.60		£
DISK STORAGE (35)		£17.00		£
DISK STORAGE (80)		£29.00		£
SEND DETAILS ON				

TOTAL SUM ENCLOSED (Cheque or credit card no.) £_ ALL PRODUCTS ARE BRAND NEW, BOXED AND OFFERED WITH FULL MANUFACTURERS WARRANTY. ALL QUERIES WILL BE ANSWERED BY MAIL

MICROWARE

637 Holloway Road, London N19 5SS. Telephone: 01-272 6398/6237 Telex: 297598 MICROW G.

14 Charles Street, Hanley Stoke-on-Trent 269 883 I enclose my order for the above products.

Name_ Address_

Signed.

THE business programs reviewed this month are a selection from those available in the Gemini Combination Homepack and Businesspack. In addition we have included a look at Dbasebeeb from Carrera Computing.

THE aim of Stock Control from Gemini is, as one would expect, to help commercial users to record and control their stock.

The program is available on tape or disc. But it is not a true disc-based system in which a large file of data is kept on disc and records read from and updated to the disc as required.

The whole stock file has to be read into memory for processing and this puts severe restrictions on the number of records that can be held and the quantity of data that can be held in each record.

Gemini say that up to 50 stock records can be held on the 16k BBC Micro or 220 records on the 32k machine.

Of course more than one stock file could be created and brought into RAM as needed. But this solution would be tedious if discs were used and not at all practicable with tape.

For each item of stock the program records a reference (7), description (23), unit quantity (9), units in stock (5), cost price per unit, selling price per unit, minimum stock level (5), re-order quantity (5) and supplier name (23). The figures in brackets show the maximum characters in each field.

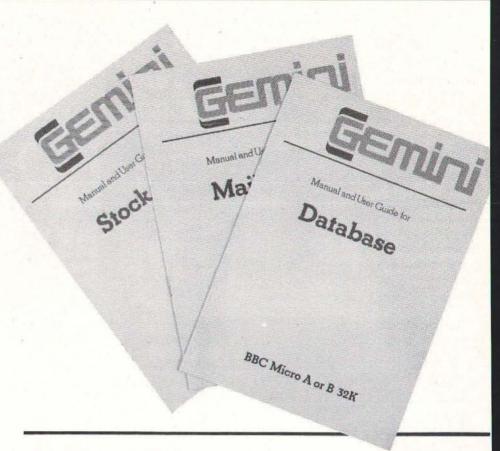
When using the program items of stock are referred to by their record number (1 upwards) which is allocated when the record is first put onto the file.

The above might seem to be a comprehensive list of the data a business would need to control its stock, but in practice it would normally be necessary to record additional information.

For example, many businesses record details of stock movements – dates and the quantities received and despatched.

To record such information would add enormously to the amount of data to be held in each record and would force a true disc-based system to be used.

However, even within the context of having the whole file in the memory, it is easy to think of useful – but compact –



Mind your own business records

Four software packages reviewed by KEN GARRETT

data that could be stored.

An option the program offers is to print out a list of all items where the quantity in stock is less than the minimum stock level specified.

This implies that we will soon run out of these items and that more — the re-order quantity — should be ordered.

However there is no field on the file where we can indicate that we have placed an order and are awaiting delivery.

When the understocked items are listed by the program we would have to go through the list, comparing it with a manually kept file of copy orders to make sure that we do not inadvertently place a duplicate order.

The program allows the basic functions of adding a new record, changing any field of a record, updating the balance of stock held for deliveries in and despatches out, and of deleting a record.

The last function also offers the

facility of compacting the records.

If item 20 were deleted and the file compacted then all the records subsequent to 20 would be "shuffled down" by one record.

This is a facility that would need careful use, as renumbering stock records is likely to lead to considerable confusion.

To make use of data the records can be inspected on the screen and printouts obtained of all or parts of each record.

Also two more specialised screen reports are available – the understocked item – mentioned above – and what is termed a financial summary.

The latter gives totals of the cost value and the selling value of all items in stock and also displays the overall gross profit margin, defined as total sale cost divided by total sale value.

It should be pointed out that the two totals produced here will be of very limited use for any accounting purpose.

This is because each item of stock

should be valued in the accounts at the lower of its cost and its net realisable value.

In simple terms this means that if an item is going to be sold for less than it was bought then that item should be valued at its selling value.

Therefore the stock valuation that may be required by accountants would be one in which some items will be included at their cost and others at their net realisable value. The program will not produce this calculation.

The financial summary also calculates what is termed as the "cost of new purchases". This is, for each item of stock where the quantity is below the re-order level, the total of re-order quantity multiplied by cost price.

Again this probably will not be of great practical use to a business as it is unlikely that all understocked items will be ordered precisely when reported in their re-order quantities.

Unfortunately the program gives no warning or special report when a quantity of stock held appears to be negative.

If this occurs it suggests that there has been a bookkeeping error. I think that this should be reported to the user for investigation.

The program is menu-driven and all screen formats are well-designed and make good use of colour. However in my opinion the program offers only rudimentary help in stocktaking and something better ought to be possible in what is billed as business software.



THE Mailist system was designed with the primary aim of producing address labels on a printer. It can also be used as a simple name and address file on which various sorts and searches can be made.

The program is available on disc and tape but, again, is not a true disc-based system, as the entire datafile has to be in memory.

Several files could be used, and according to Gemini the system allows a maximum of 220 records to be on each file on the 32k machine (50 records on the 16k).

Each record has fields for name, title, two general address lines – each field with room for up to 22 characters – town, county – up to 18 characters each – post code and telephone number. There is also room for a what is called a searchkey, which will be discussed later.

All the basic functions of adding, amending and deleting records are available, together with the ability to browse through the file.

There is also the facility to sort the file on any one of the fields such as into alphabetical order of name, and it is perhaps here that we begin to feel the limitations of the system.

When we say alphabetical name order we would normally use the surname to define this. However mailing lists would almost certainly include initials or forenames and we might also want to include the form of address to be used (Mr, Dr, Ms and so on).

As there is only one field available for all of the name data and as the sort treats the leftmost characters as the most significant, the results of a sort will probably not be as required, all Drs being listed before all Misses and so on.

Curiously, a sort seems to be undone if a record is deleted without the file having been saved in its re-sorted form and then read back.

A search facility allows the user to select records which have certain values in any given field. For example, we could look for all addresses in which the town was London.

It is possible to search on any one field or on the searchkey or on both.

The searchkey is an additional field which can hold up to 10 characters and each character position can code for a given quality.

The first position could be used to describe a person's credit rating (for example, 1-6), the second position could describe the type of business (such as A-K) and so on.

A search can make use of any number of the character positions in the searchkey.

Once again the system could be limited in some areas, particularly when using the name field, as it looks for a match in the leftmost character positions.

So if we wanted to select the record of Mr Brown, who was stored on the file with an unknown initial, we could not use the search facility to do this.

Two types of printout are offered – a full address label (multiple copies if wanted) or a telephone list. In both either the whole file can be printed or



only those records which have been found in a search.

The program is easy to use and has attractive use of colour. Bearing in mind the limitations mentioned, the program can handle simple mail list applications competently. See, however, my comments at the end of the review of Gemini's Database program.



THE program Database allows a file of data to be set up, manipulated in a variety of ways and saved for future use.

The user begins by deciding on the record layout. This is done by defining the number of fields there are to be in each record and, for each field, its length and whether it is to hold alphabetical data.

A field is a distinct piece of data such as a name or a price. Gemini says the only restriction on record layout is that there can be no more than 12 fields for each record.

When a file's format has been set it cannot be altered other than by going back and starting again.

Once the record layout has been defined the user can add, delete or amend the records and can display on the screen or print whole records or any one field of the records.

There is no facility to format the output of records on screen or printer, the fields appearing as a list in their input order.

The file can be sorted on any single field into ascending or descending order and there is also the facility to search for records which have fields conforming to user-defined limits.

The search can be performed using up to eight selection criteria. For example, if on the name field the limits are A and C and on an age field the limits are 20 and 30 then the search will give all those records in which the person has a name beginning with A, B

From Page 73

or C and who is aged between 20 and 30.

In other words, the search gives the records which are the intersection of the selection criteria.

Another facility offered by the program is that of performing two types of calculation on any one numeric field.

In the first type a field can be totalled and its sum and average displayed. In the second, a field can be used as a variable in a Basic calculation and the answer stored in another, or the same, numeric field.

This type of calculation can be applied to any range of records on the file.

To be used by the program a file of data has to be copied into memory and this will limit the size of file that can be dealt with.

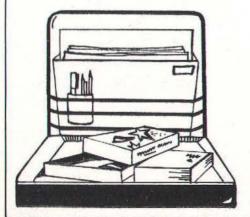
As a rough guide there is room for about 120 records on a file consisting of records containing about 50 characters each.

To sum up, this is an easy to use but rather unsophisticated database program. I think it a pity that Gemini could not have offered a system which integrates the facilities available in Mailist with those available on Database, as so many of the processes are similar.

For if a user wants to hold a lot of detailed data on a customer the Database program would probably have to be used, despite the searchkey on Mailist.

This data would almost certainly include names and addresses, but as there is no way in which these fields could be used by Database to produce address labels it would have to be duplicated on the Mailist file to produce labels.

There would need to be a continuing effort to ensure that data was amended



consistently on both of the files.

Many users, I feel, would find such duplication of effort unacceptable.



A SPLENDID database program which incorporates a range of facilities similar programs will find hard to match is **Dbasebeeb**, by Carrera Computing.

The screen presentation is good and the program makes very full use of colour.

It has the basic functions of adding, amending, deleting and saving records and also a generous supply of more specialist options which I will describe in turn:

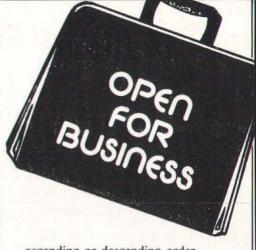
- Add an extra field. If the format of the records proves inadequate and extra information has to be held, then this facility allows extra fields to be easily incorporated into the records without having to start a file from scratch.
- Define screen format. The layout of the fields as they appear on the screen can be freely altered and re-altered. When a file is saved details of the format currently being used are preserved so that when that file is loaded again the records are displayed as before.
- Printing the file. All or some of the records on the file can be printed out, records being chosen individually by record number or according to search criteria. (See the Find function below.)

The user can also define which fields of the records are to be printed and the format in which they are to appear on the printed output. They could, for example, be printed out in address label format.

 Calculations can be performed on numeric fields and the user can choose between either obtaining the total of a numeric field or performing other calculations.

Up to five field references can be made in a calculation and this will allow quite complex calculations to be performed, the answers being stored in a specified numeric field.

- Find records. Up to eight selection criteria can be applied to the records. Each criterion consists of a minimum and a maximum field value or a search can be performed for the occurrence of a specified string anywhere in the field. This option can be used in conjunction with the print facility described above.
- Sorting. The program asks the user to indicate which field is to be used for the sort and whether the sort is to be in



ascending or descending order.

Each sort is performed on one field at a time, but if the file is to be sorted on the basis of more than one field, performing the sort in reverse order of significance will result in the required file order.

If a name and address file is to be sorted in ascending name order within town order (that is the alphabetically arranged population of Abington appearing before the population of Bath and so on) sorting on name then on town will produce the correct order.

 Multiple entries. This allows identical data to be placed in chosen fields of all or a number of records.

One drawback is that such a comprehensive program occupies quite a lot of memory, limiting the space available for the data. Approximately 100 records, each of about 55 characters, can be held in any file.

These figures are based on the whole of the program being resident in memory and could be improved if the program could be broken into segments, bringing into memory only the piece needed at the time. This is precisely what is offered on the second side of the tape.

The program is divided into five sections. The main control section is always resident in memory and the four others are overlayed into memory as required.

This increases the capacity of files which can be handled to approximately 155 records of 55 characters.

To use the segmented program as described really requires a disc drive so that the loading of sections is reasonably fast.

However if a user finds that only certain sections of the program are ever required, instructions are provided on how to construct a tailored program.

This would then be used as a single, unsegmented program and would work well on tape.

This is an excellent database program offering a very wide range of facilities. I look forward to further offerings from Carrera Computing.

ROM SOF

DISC DOCTOR is a general purpose utility ROM which adds 20 new commands to the BBC Micro. Most of these are concerned with disc operation although some of the commands are general

The extensive range of disc commands include a disc search routine and a very easy to use sector editor which allows any sector to be examined and changed if necessary. The built-in formatting command has a special option allowing dual catalogues on each side of the disc, so that up to 60 files per side may be used - almost twice the normal limit.

*RECOVER and *RESTORE commands are provided to help in the restoration of deleted or partially corrupted files. Any area of the disc may be transferred to memory, altered and *SAVEd or *RESTOREd back onto the disc. These commands prove invaluable when hours or even days of work are accidentally lost.

Many disc users often encounter the frustration of programs originally designed for use on cassette and require relocating to operate on disc. Disc Doctor provides commands to help with the transfer. *TAPEDISC and *DISCTAPE provide a simple means for automatically transferring non-protected files between tape and disc. Once programs are on disc, there are several relocation functions available. *MOVE will move a program from one page in memory to any other. *DOWNLOAD will load the program from disc and automatically move it to a specified position. *MENU is more comprehensive still, offering a menu of programs available and allowing single key-press selection of any one. The chosen program is then loaded, re-located if necessary and automatically executed, whether BASIC or machine code.

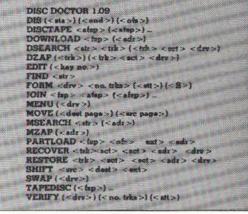
General purpose commands include: *DIS - which will disassemble an area of memory, following or skipping jumps, adding an offset, disassembling an instruction at a time or disassembling continuously.

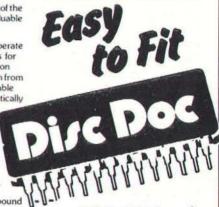
*MSEARCH - to quickly locate any string of bytes in memory, specified either as a character string, numeric values of a mixture of both.

*MZAP - a very easy to use memory editor, allowing the user to scroll quickly up/down memory. It can be called from other programs to examine memory, then return to the program.

*EDIT · will list any or all of the function key definitions, so that the user may edit and copy them.

The DISC DOCTOR ROM contains a full help menu listing all the commands and their syntax for quick reference. A spiral-bound manual gives general information about discs and describes each of the commands in detail, with examples. Easy to follow fitting instructions are supplied, allowing the ROM to be easily fitted by even the inexperienced user.





£33,35 incl.



The GRAPHICS EXTENSION ROM brings 30 new powerful graphics commands to the BBC machine. The commands may be typed immediately or included within programs written in BASIC, BCPL, FORTH, etc. The commands act quickly (being machine code) and are always available without taking large amounts of program memory. The commands can be split into three catagories:

1. Sprite Graphics

A sprite is similar to a user-defined character, except that sprites may be multi-coloured, several times larger (8x8 to 24x24 pixels in size), they are easily defined and altered with in-built commands and may be saved and later loaded. Sprites may be displayed and quickly moved around. Up to 32 different sprites may exist at the same time. 'Films' may also be created, in which any sprite is treated as a single 'frame'. Each time the 'film' is used the next 'frame' in sequence is automatically displayed, allowing simple animation of sprites. Any number of the possible 32 sprite numbers can be defined instead as a 'film' which may include a list of up to 47 'frames' in any order.



2. LOGO 'Turtle' Graphics

By using simple FORWARD, BACKWARD, LEFT and RIGHT commands a 'turtle' can be moved very quickly around the screen, producing intricate patterns by the most user-friendly means. The commands may be included in structured BBC BASIC programs providing a system faster and more powerful than many of the packages currently used to demonstrate LOGO turtle graphics.



3. General purpose commands

- * FILL will fill an intricate shape.
- CIRCLE provides fast and easy circle drawing.
- * ARC fast easy arc drawing.
 * PLOT provides 3D graphics drawing by plotting with X, Y, and Z co-ordinates.
- * SCALE allows a scaling factor to be applied to everything subsequently plotted.
- ROTATE applies a rotation upon all subsequent standard PLOT, DRAW and MOVE commands so that they are rotated around any origin.

A built-in help menu showing the syntax of all commands is provided for quick reference. Included in the package is a comprehensive spiral-bound manual and step-by-step fitting instructions, suitable even for the inexperienced.

Further details available upon request.



£33.35 incl.







HIGHLANDS COMPUTER SYSTEMS



COWELL ST., LLANELLI, DYFED SA15 1UU Tel: 05542 70517

DISC DRIVES FOR THE BBC

Code		Price £
D111	Single Disc Drive Single Sided 40 Track 100KB	149.00
D121	As D101 but Dual Size Case for Expansion	159.00
D201	Dual Disc Drive 40 Track 100KB per Drive	275.00
D122	Single Disc Drive D/S 80 Track 400KB Dual Case	215.00
D122S	As D122 but 40/80 Switchable	229.00
D202S	Dual 400K Double Sided 40/80 Switchable	399.00

All prices include case, system disc, manual and cables.

D101	Uncased 100K 40 Track Disc Drive	129.00
D102	Uncased 400K Disc Drive	189.00

Single Drives are expandable to Dual where indicated, by using an additional uncased drive.

These Drives run off the BBC's power supply, but should you wish to have an external supply then order:

DPU1 Power Supply	29.00
Torch Z80 Disc Pack	825.00
Torch Z80 Disc Pack complete with DFS Kit	899.00

Do you want the <u>Merlin Scribe Word Processor</u> with your Drive? – only £49.00 incl. if purchased on the same order as the Disc Drive. Regular price £59.80.

All products are guaranteed for one year from date of despatch.

★ Prices include carriage and VAT at 15% ★

Please pay by Access or Crossed Cheque/PO.



PROGRAMMERS' WORKSHOP

Find the right PAGE but don't lose your place

IF YOU have ever tried to hold two Basic programs in memory at the same time you may well have encountered problems when it came to running them.

The User Guide indicates on Page 317 that this is possible by using the pseudo-variable PAGE, but warns "use with care" without saying how.

So how can it be done?

First, let us look at this pseudovariable PAGE. Normally, PAGE = &E00. If you have extra ROMs fitted, such as a DFS, you may find that PRINT PAGE gives some other value such as &1900.

PAGE always has a value that is a multiple of &100 (256 in decimal). Try making PAGE some other value and it is made equal to the nearest multiple of &100 below. For instance, try:

PAGE = &2399 PRINT ~PAGE

You should find that PAGE has the value &2300.

PAGE is the pointer that indicates where in memory the Basic program starts.

Two programs can be stored in memory at once by starting them at different PAGE values. You then choose the program you want by setting PAGE to the relevant value.

Try this:

PAGE = %2000	
NEW	
10 REM PROGRAM I	
20 A\$ = "PROGRAM I"	
30 PRINT A\$	
40 END	
PAGE = &2400	
NEW	
10 REM PROGRAM II	
20 A\$ = "PROGRAM II"	
30 PRINT B\$	
40 END	

By ERIC H. CRISP

Notice that NEW was entered before typing in the program. This is necessary to reset the internal pointers to the new value of PAGE.

If NEW is omitted a "bad program" error or even a system crash is probable.

If you now make PAGE = &2000 and type OLD and LIST, you get Program I. Make PAGE = &2400 and type OLD and LIST and you get Program II.

Note that OLD is typed in to recover a program at a particular PAGE value. This ensures that the internal pointers match the program at this PAGE value.

If there is no program, or the program at this PAGE value has been corrupted, a "bad program" error results.

Two of the main pointers OLD sets are TOP and LOMEM. TOP is a function that indicates the top of the Basic program.

LOMEM is a pseudo-variable that indicates the start of the space allocated for variables and is normally set to TOP.

The other main pointer not mentioned so far is the pseudo-variable HIMEM. This is normally set to the start of screen memory.

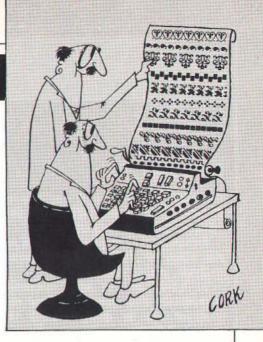
The space for variables is restricted to between LOMEM and HIMEM.

Now back to Programs I and II. To aid swopping from one program to the other, set up the red function keys as follows:

*KEY1 PAGE = &2000 | M DLD | M LIST | M *KEY2 PAGE = &2400 | M DLD | M LIST | M

Just press function key f1 to see Program I and f2 to see Program II.

To see if the programs will run, press fl and type RUN to run Program I and



press f2 and RUN to run Program II. You should find that it works.

Now add a new line to Programs I and II. Press f1 to get Program I and type in:

35 DIM A(1000)

Press f2 to get Program II and type in:

35 DIM B(1000)

It may be an idea at this stage to save Programs I and II in case of accidents by pressing f1 and typing:

SAVE "PROG1"

and pressing f2 and typing:

SAVE "PROG2".

Now run Program I in the same way as before. It should still be all right. Press f2 and you should find that Program II has been corrupted, resulting in a "bad program" error.

If you saved the program as suggested earlier, do the following to load it back into the correct place:

PAGE = &2400 LOAD "PROG2"

Pressing f1 and f2 should show that both programs are there again.

If you run Program II first this time you should find that Program I is still safe. But as soon as you run Program I, Program II is corrupted.

The reason for Program I corrupting Program II is that Program I uses the memory starting at LOMEM to store its variables.

Program I has a lot of variables, because of line 35. So although Program I's LOMEM (&2044) is some way below Program II's start, the variables overlap into Program II's space.

Without line 35 this overlapping of space does not occur because of the much reduced memory need for the variables

This problem is solved by restricting

PROGRAMMERS' WORKSHOP

From Page 77

the area variables can use above Program I by keeping LOMEM at the value of TOP for Program II.

However OLD changes LOMEM to the value of TOP for the present program, and so does RUN.

So LOMEM will need resetting immediately after doing OLD and the program run by doing GOTO 10 instead of RUN.

Thus, KEY1 described earlier would now be:

*KEY1 PAGE=&2000;M OLD;M LOMEM=&2446 |M LIST ;M

where &2446 is the value of TOP for Program II.

Now try running Program I with a GOTO 10 (after pressing f1) and see if Program II is still intact.

You should find that corruption no longer occurs because the variable space is kept above Program II.

Now that LOMEM is kept at the same value for both programs, each program uses the identical space for variables so that those set up in one program can be used in another.

The trouble is that OLD effectively loses all but the resident integer variables as does RUN and setting LOMEM.

The way round this is not to use OLD at all and use a GOTO after changing PAGE.

There is a slight problem with this method. Since OLD has not been used after changing page, TOP will still have its old value.

Unfortunately you cannot change TOP as you can PAGE and LOMEM. Try it and you should get a "Syntax error" because it is a function and not a variable.

However, TOP can be set by typing LIST after changing PAGE.

To see this, get Program I by pressing f1. Then:

PRINT "TOP

to see its value (&2044). Then type:

PAGE = &2400

to get Program II and:

PRINT TOP

to see that its value is still &2044. Now type:

LIST PRINT *TOP and you should find that TOP is now correct for Program II (&2446). Creating an error instead of LIST by pressing Escape, for example, will also set TOP.

So change function key 2 as follows: *KEY2 PAGE = &2400 |M LIST |M GOTO 10 |M

and also insert line 32 as follows:

32 PRINT A\$

This now changes LOMEM to &244F so function key 1 needs



changing so that it has LOMEM = &244F in it.

If you run Program II at this stage with RUN you will get a "No such variable at line 32" error since it has not been defined yet.

However if you press f1 and type:

GOTO 10

to run Program I then press f2, to run Program II, no error occurs and line 32 prints A\$ since A\$ was defined by Program I.

Unfortunately you cannot LIST from within a program to set TOP. The only way to get TOP right from within a program is to directly change TOP in zero page where it is stored in &12 and &13.

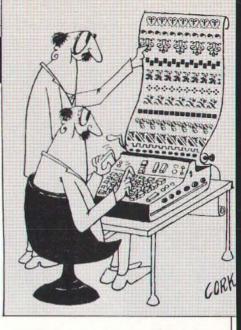
TOP should now be &244F for Program II. So doing:

?&12=&4F:?&13=&24

will set TOP to &244F.

The processor always stores its numbers back to front which is why memory location & 12 contains the least significant half of the value.

So Program I can be changed to go straight into Program II while keeping



all variables. The changes to Program I are:

15 LOMEM = &244F

40 PAGE = &2400

50 ?&12 = &4F : ?&13 = &24

60 GOTO 10

If you now press f1 to get Program I and run it using GOTO 10, it should automatically run Program I and Program II.

If you are not convinced by the result on the screen, then insert line 32 into Program I:

32 A\$ = "FROM PROGRAM 1"

A few final points to note. The area of memory reserved for your variables is between LOMEM and HIMEM. This space will vary if you change mode, as this will change HIMEM.

If the space needed for the screen is already occupied by variables, a "Bad mode" error results.

If there is not enough room between LOMEM and HIMEM for the variables then a "No room" error results.

Also, if you store any of your programs above the lowest value of HIMEM that occurs, you will be in danger of losing these programs when you change mode.

Finally this technique can enable many programs to be in memory at once providing:

- LOMEM is always set at the start to the value of TOP for the program highest in memory, and is then left at that value.
- TOP is set by LIST or POKEing zero page after each changing of PAGE.
- The programs are run by using a GOTO.

Both programs and variables should then be preserved.

Next month these ideas will be expanded to include procedures and GOSUBs and the problems of changing mode in them.

Now YOU can go for gold ... with the MICRO

Fancy pitting yourself against the world's best at this summer's Olympics?

You can do so without going anywhere near Los Angeles — with the most challenging package of programs of 1984.

MICRO OLYMPICS is more than a game. It's a brilliantly written collection of ELEVEN track and field events.

And because we know we're going to sell many thousands of them we've brought the price right down — to just £5.95.

Ever imagined yourself as another Seb Coe? Then try to run against the world record holder at 1500 metres. And if that distance is too much for you then there's always the 100, 200, 400 and 800 metres to have a go at.

Not much good at running? Don't worry, MICRO OLYMPICS has many more challenges for you. Why not try your skill at the high jump or the long jump?

And if you can't beat the computer at running or jumping then you can always throw things around in frustration! The trouble is that it's just as hard to be a champion at the discus, the hammer or the javelin.

And the pole vault takes the event to new heights!

Yes, it's fast, furious fun, pitting yourself against the world's best times and distances on your micro.

You may not be another Steve Ovett or Alan Wells, but with practice you COULD become the Micro Olympics Champion!

This is a special joint offer from The Micro User and Electron User



Play Micro Olympics

– and let your fingers
do the running!

Send for it today

Please send me copy/copies of Micro Olympics I enclose cheque made payable to Database Publications Ltd. for £	□ BBC 'B' cassette □ Electron cassette □ BBC 40-track disc □ BBC 80-track disc Please tick box	£5.95 £5.95 £7.95 £7.95
I wish to pay by ☐ Access ☐ Visa No	Expiry date	
Signed		
Name		
Address		Marie Contract

Post to: Micro Olympics offer, Database Publications, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Learn a foreign la in twelve hou It's as easy as E

rrrrrr

Your BBC Micro can now teach you a foreign language in just 12 hours, via Linkword from Acornsoft.

Linkword is a software series of four language courses—French, Italian, German and Spanish and is ideal for those who want to pick up an elementary knowledge before going on holiday, or for business people who need to acquire the basics in a hurry.

Each 12 hour program is based on a revolutionary new format, making learning enjoyable rather than laborious.

For instance, the Spanish word for bread is 'pan', so you are asked to imagine a pan full of bread and hold that image in your head for 10 seconds.

This method will rapidly enable you to



nguage S. BC.

build up a vocabulary of around 400 words covering a wide range of useful topics.

Once again, it's another exciting dimension to fulfilling your BBC

Micro's potential.

You can order by filling in the coupon opposite. Credit card holders can order by calling 0933 79300 during office hours.

Alternatively, you'll find all four Linkword programs at your local Acornsoft dealer. (To find out where that is, simply call 01-200 0200.)

They come in cassette form, complete with an audio cassette demonstrating the correct pronounciation.

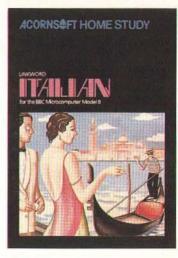
And at just £14.95 each it shouldn't be hard to talk yourself into buying one.

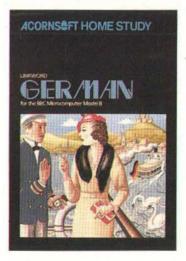
ACORNS&FT HOME STUDY

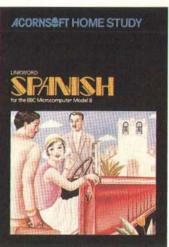
LINCKORD

FRENCH

To the BIC MOTOCOMPLET Model B

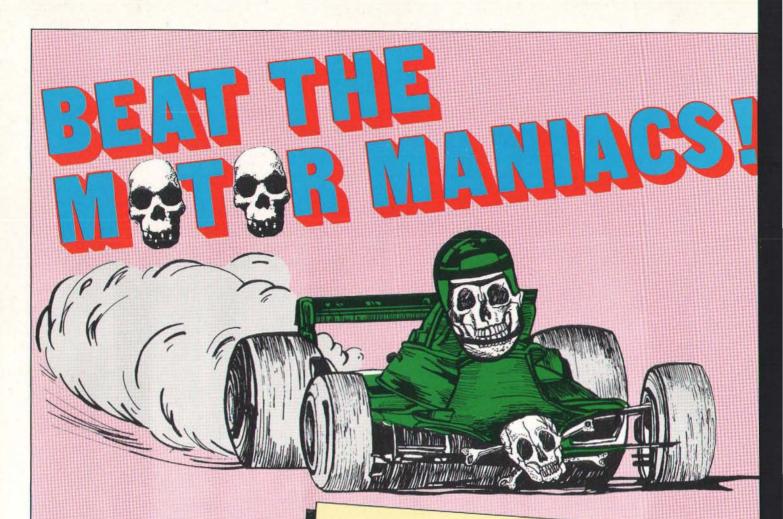






Card Number		gue□
Amex/Diners/Visa/Access (Delete) Please send me details of the B Microcomputer System □ Please send me the latest Acord Name		gue□
Amex/Diners/Visa/Access (Delete) Please send me details of the B Microcomputer System □		gue□
Amex/Diners/Visa/Access (Delete) Please send me details of the B Microcomputer System □		
Amex/Diners/Visa/Access (Delete)	BC	
	1 THE ST.	
Canada Name In the Control of the Co		
I enclose PO/cheque payable to Or charge my credit card.	o Acornsoft	Ltd.
TOTAL		
Spanish		SBX16
German		SBX15
Italian		SBX14
French		SBX1
packages at £14.95 each. PROGRAM QUANTITY	TOTAL	Acornsof use only.
		(Code
Please send me the following la	anguage soft	ware





You need nerves of steel - and a streak of insanity to take up **DAVID SHEPERD's** death-defying road racer

ROAD Racer is a compulsive, high speed motoring game that will test your road skills to their limit.

The "plot" is simple. You are driving down a road trying to dodge oncoming cars driven by maniacs like you!

All you have to do to win is survive and that's easier said than done.

The brilliant 3D graphics extremely effective, but you may not have time to notice them. In fact we'd better tell you that there are four different lots of scenery - you'll almost certainly never experience them all.

The controls couldn't be simpler. They have to be - you need all your attention on the screen.

> M = start = right Space = freeze

Procedures **PROCgame**

Starts game **PROCsetup** Sets up data and car positions PROCsetup 1 PROCroad

Resets variables after a crash Sets up mountains, etc. PROCroad1 Clears road after crash PROCtele_pole Sets up telegraph poles **PROCdrawl**

Draws telegraph poles **PROC**move **PROC**movecar

Changes player's car position corresponding to input **PROCear**

Chooses randomly, computer's cars

PROCcar1, PROCcar2, Draw computer's car corresponding to the choice of Draws a crash PROCend

The end of the game. Enter name etc. **PROCdelay** Gives a short delay **PROCscore**

Prints the score on top of the screen **PROCinstructions** Gives instructions for the game

Variables

Number of lives left Changes the stop and start of the car Chooses computer's car (used in PROCcar)

Moves player's car position Moves computer's cars Computer's X coordinates

Computer's different cars depending on X and Y Computer's Y coordinates

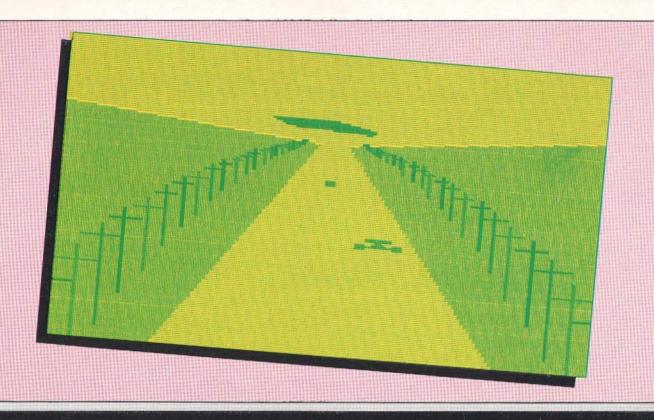
positions

Used in crash routine Changes colour for background scene

Player's score Changes background scene Sets CN1\$ etc... in PROCsetup

GO GY CHC MCP% MC1%,MC2%,MC3% CX1%,CX2%,CX3% CY1%,CY2%,CY3% CN1\$,CN2\$,CN3\$

count CO1:CO2 score scene%,TI CC\$,PC\$,SC\$



Road Racer listing

- 10 REM ****** ROADRACER *****
- 20 REM ***** BY D M SHEPHERD

- 30 REM ****** (C) MICRO USER 1984 44
- 31 HZ=300
- 35 CLEAR 40 MODE 1
- :PROCinstruction
- 50 MODE 2
- 60 ON ERROR VDU 4
 - : MODE 1
 - : REPORT
 - :PRINT ERL
 - :END
- 70 REM RACE
- 80 CLS
- 90 PROCsetup
 - :PROCsetup1
- 100 PROCquae
- 110 DEF PROCque
 - :CLS
- 120 TIME =0
- 130 PROCroad
- 140 PROCtele_pole
- 150 REPEAT
- 160 FOR scene%=1 TO 4
- 170 PROCeove
- 180 NEXT
- 190 UNTIL FALSE
- 200 ENDPROC
- 210 DEF PROCsetup
- 220 ENVELOPE 1,6,2,20,16,16,0,0 ,126,0,0,-126,40,40

The listings in this article are produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are in the July 1983 issue of The Micro User.

- 230 VDU 23;8202;0;0;0
 - :CLS
- 240 DIM CY1%(21), CY2%(21), CY3%(21) ,CX17(21),CX27(21),CX37(21)
 - ,CN1\$(21),CN2\$(21),CN3\$(21)
- 250 FOR VU=224 TO 233
 - :READ A, B, C, D, E, F, 8, H
 - : VDU 23, VU, A, B, C, D, E, F, 6, H
 - :NEXT VU
- 260 CC\$=CHR\$ 225+CHR\$ 224+CHR\$ 226
- 270 PC\$=CHR\$ 228+CHR\$ 229+CHR\$ 230
- 280 SC\$=CHR\$ 233+CHR\$ 231+CHR\$ 232
- 290 NAME\$="COMPUTER"
 - :Hi=HZ
- 300 RN1=1
 - :RN2=1
 - :RN3=2
- 310 REM ***SET UP CAR POSITIONS***
- 320 FOR I=1TO 6STEP RN1
 - :READ CY1%(I)
 - :NEXT
 - :FOR I=1TO 6STEP RN1
 - :READ CX1%(I)
 - : NEXT
- 330 FOR I=1 TO 6 STEP RN2

- :READ CY2%(I)
- :FOR I=1 TO 6 STEP RN2
- :READ CX2%(I)
- : NEXT
- 340 FOR I=1TO 11STEP RN3
 - : READ CY3% (I)
 - :NEXT
 - :FOR I=1TO 11STEP RN3
 - :READ CX3%(I)
 - . MEYT
- 350 CN1\$(1)=CHR\$ (232)
 - :CN1\$(2)=CHR\$ (232)
 - :CN1\$(3)=CHR\$ (232)
 - :CN1\$(4)=CHR\$ (227)
 - :CN1\$(5)=8C\$
 - : CN1\$ (6) =CC\$
- 360 CN2\$(1)=CHR\$ (232)
 - :CN2\$(2)=CHR\$ (232)
 - :CN2\$(3)=CHR\$ (232)
 - :CN2\$(4)=CHR\$ (227)

 - :CN2\$(5)=SC\$
 - :CN2\$(6)=CC\$
- 370 CN3\$(1)=CHR\$ (232)
- - :CN3\$(3)=CHR\$ (232)
 - :CN3\$(5)=CHR\$ (232)

 - :CN3\$(7)=CHR\$ (227)
 - : CN3\$ (9) =SC\$
 - :CN3\$(11)=CC\$
- 380 BY=0
 - :60=1

Turn to Page 131



Whether its your first computer or whether you're already an enthusiast, LVL COMPUTERTOWN offers you the quality of service you expect from experts. If you invest money, you go to a bank or a broker - a specialist who can guide and advise you on the best return for your capital. At LVL COMPUTERTOWN we're specialists too. We're there to help guide you through the micro maze, keep you up to date on innovations, help you get the best value for money, whether your computer is for you, your children or your business. Your computer can change your life - make sure you change it for the better:

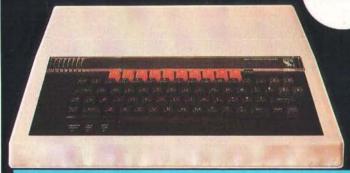
Come and talk to the experts and move into micros with LVL COMPUTERTOWN

COMPUTERS



The new personal computer from Acorn Computers. An ideal machine for learning computing - and for having a lot of fun at the same time. But it's much more than just a toy. It's graphic facilities are the most sophisticated available in it's price range.

£199.00



BBC MICROCOMPUTER

 MODEL A
 £299
 MODEL B with DOS
 £469

 MODEL B
 £399
 Model B with DOS & ECONET

 MODEL B with ECONET £446
 £516

MONITORS



DECCACOLOUR

14" Colour Monitor

£247.25



SABA

14" Colour Monitor/Colour

£274.45



MICDOVITEC

14" Colour Monitor

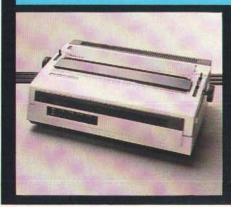
£247.25



SANYC 12" Green Screen

£102.35

PRINTERS



	_	_	_	_	_	_	_	_		_	_	_	_	
Seikosha GP100A Silver Reed EX500				25.55										238.05
Parallel Silver Reed EX500		• •						٠	• •		• •			343.85
Serial														378.35
Silver Reed EX550 Parallel											•:•			534.75
Silver Reed EX550 Serial													Sai	569.25
Epson RX80														
Epson FX80 Epson RX80 (F/T) .														366.85
Epson MX100 (B2 Co														



DATA RECORDERS



REFLECTION SUPERIORITY

The Bell & Howell/LVL Computer Compatible Data Recorder

- O Automatic Level Control
- Automatic Tape Stop 0
- Tape Counter 0
- O Remote Motor Control

DISK DRIVES



An example of superior technology, total reliability and outstanding performance, combine to produce the LVL Disk Drive

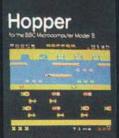
Truly professional units designed to work with the BBC Microcomputer.

> CHECK OUT NEW LOW PRICES WITH YOUR NEAREST DEALER

SOFTWARE

DESIGNED FOR THE BBC ADVENTURES MICROCOMPUTER

ACORNSOFT GAMES



LANGU															
LISP												£	16	3.8	15
FORTH												£	16	3.8	35
GAMES															
Monster													££	9.8	95
Snapper													£	9.6	5
Planetoi	d .												£	9.6	95
Arcade	– Act	io	n									£	11	. 9	90
Rocket F	Raic	ĭ					oeth Vers						£	9.9	95
Meteors													£	9.8	95
Arcadia	ns												£	9.8	95
Sliding-l	Blox	k	P	112		le							22	9.8	95
Cube M	aste	er											£	9. 9	95
Starship	Co	m	m	ar	10	i							£	9. 9	95
Snooker					Ĩ	Ī							£	9.8	95
Super In	vac	le	rs										£	9.8	95
Hopper													£ 9	9.9	95
Colditz													£	9.9	95
Doctor W	/ho	ï										٠,	211	0 (າດ
White Kr	uah	t II	Ċ.			i	Ü	Ĭ	ì	i	Ĭ.		21	2.0	00
Missile B	ase								į,				£	9.9	95
Draughts															

Philosophers Quest				£9.95
Castle of Riddles				£9.95
Countdown to Doom				£9.95
Sphinx Adventure .				£9.95

CENERAL

Desk Diary						£9.95
Creative Graphics	;					£9.95
Graphs & Charts						£9.95
Tool Box					£	21.00
Record Keeper					£	13.80
Magic Garden .						£9.95

EDUCATIONAL

Map References			£7.50
Lasermaths	100		£7.50
Classmaster	100		£20.00
Algebraic Manipulat	ior	١,	£9.95
Word Sequencing .			£11.90
Missing Signs			£11.90
Number Balance			£11.90
Word Hunt			£11.90
Density Circuit			£11.90
Chemical Analysis .			 £13.80
Chemical Structures			 £13.80
Jars			£11.90
Vu-Type			£16.10

ALL PRICES INCLUDE VAT.

The items featured represent a very small selection from our vast product range, and at the time of going to press where all available from stock.

However, not all dealers carry every advertised item, please telephone before making your journey.

Further information of both product and services available can also be obtained by telephoning or visiting your nearest LVL Computertown Dealer.

C-TECH SOFTWARE 184. Market St HYDE Cheshire 061 366 8223

COMPUTER CITY 78. Victoria Rd WIDNES Cheshire 051 420 3333

CUMBRIA

THE COMPUTER SHOP 56/58 Lowther St. CARLISLE Cumbria 0228 27710

ESSEX

I. Northmall
GRAYS, ESSEX
0375 79834
BROADWAY MUSIC AND VISION Woodford Green

ESSEX

01 504 7500

GREATER MANCHESTER

LOMAX 8 Exchange St. St. Annes Square MANCHESTER

WORC S SPURTREE COMPUTING

Council Buildings Teme Street.
TENBURY WELLS.

Worcestershire 0584 811353/811304

MERSEYSIDE

THORNGUARD 46. Pensby Rd HESWALL The Wirral, Merseyside 051 342 7516

NOTTS

S P ELECTRONICS 48. Linby Rd. HUCKNALL Notts: 0602 640377

COMPUTERTOWN (UK) LTD. 230, Derby Rd, STAPLEFORD Notts. 0602 399484

OXFORD

ABSOLUTE SOUND AND VIDEO (Oxford) Ltd. 19. Old High St. Headington OXFORD

0865 65961

K & K COMPUTERS 32. Alfred Street, WESTON SUPERMARE

Avon 0934 419324 COLSTON COMPUTER CENTRE LTD. The Colston Centre
11. Colston Ave. BRISTOL 0272 276619

HOME & BUSINESS COMPUTERS 59, Daisy Hill DEWSBURY Yorks 0924 455300

WEST MIDLANDS

JBC MICRO SERVICES 200 Earlsdon Ave. Nth. Earlsdon COVENTRY 0203 73813

WILTSHIRE

WILTSHIRE MICRO CENTRE Central Trading Estate. Signal Way, Old Town, SWINDON 0793 612299

HI-VU ELECTRONICS 38, Church St. Wolverton MILTON KEYNES 0908 312808

CJE MICROS 78. Brighton Rd WORTHING West Sussex 0903 213900

WIGHT

EXCELL 4. Foreland Rd BEMBRIDGE Isle of Wight 098 387 2578

YOUR LOCAL



DEALER

HEREFORE

KEMPSONS 26, St. Owen St. HEREFORD

KENT

KENT MICRO

MAIDSTONE

Kent 0622 52784

GRAVENSEND

COMPUTERS 39, The Terrace GRAVESEND 0474 50677

LEICESTER PERCY LORD & SON

63 Blaby Rd WIGSTON

Leicester 0533 785033

LONDON

CANNONBURY RADIO 185 Upper St ISLINGTON N1

London 01 226 9392

PAUL ELECTRICAL 250/2 Grand Drive LONDON SW20 01 542 6546

WOODS RADIO 257, Lavender Hill Battersea. LONDON 01 228 1768

Spectrum Members

MEDLICOTT BROS SHREWSBURY

Shropshire 0743 3060

SUFFOLK

S | EMERY & CO 10. Market Place

BUNGAY.

Suffolk 0986 2141

IRFLAND

EVERYMAN COMPUTER SERVICES

BALLYMONEY

Co-Antran N Ireland 026 56 62658

W BAGNALL

STAFFORD

0788 3420

STOKE ON TRENT

COMPUTERAMA 59. Foregate St STAFFORD 0785 41899

SURREY

HASLEMERE COMPS 25. Junction Place HASLEMERE

0428 53850 P & H ELECTRONICS

5. The Parade, Reading Road, YATELEY Surrey. 0252 - 877 222

LANCASHIRE

P V MICROS 38A Water S ACCRINGTON 0254 36521

Home & Business Computers Ltd. 54. Yorkshire Street 061 633 1608

Home & Business Computers (RCH) Ltd. 73. Yorkshire Street. ROCHDALE 0706 344654

WALES

SIR. 91 Whitchurch Rd. Cyncoed CARDIFF Wales 0222 621813

THE COMPUTER SHOP 41. The Hayes, Wales. 0222 26666

SCOTLAND

COMMSCOT 30 Gordon St. GLASGOW 041 226 4878

NORTH LAND

NEWTONS Main St. SEAHOUSES 0665 720307

If you're studying... Study our Software

We've been producing educational software for the BBC micro ever since it was launched, and our programs are in use in schools and colleges all over the country. Now, some of these programs have been specially adapted for you to use at home.

With our **Understanding Science** programs you can get to grips with subjects in Biology, Physics or Chemistry that you didn't understand, or supplement your practical work by doing simulated experiments on the computer. These programs are suitable for age 13+ and are ideal if you are studying for those all-important exams. The emphasis is on **understanding** the subject and the programs come with a detailed explanatory booklet. The first programs are ready now—

with many more to follow.

Chemistry — Symbols, Formulae and Valency

Chemistry — Chemical Equations Chemistry — Inorganic Analysis

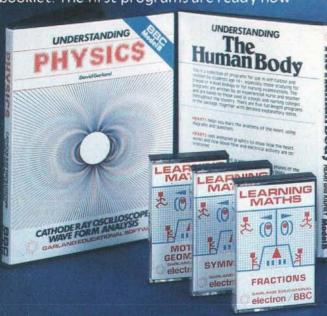
and Identification of Gases

Physics - The Oscilloscope and

Waveform Analysis

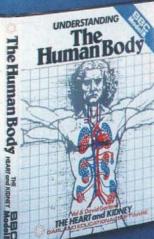
The Human Body — Heart and Kidney

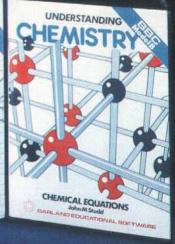
Each package costs £12.95 (cassette) or £13.50 (disc).



For younger pupils age 9+, our **Learning Maths** programs use simple games and animations to illustrate important principles of elementary Maths. There are nine titles — each containing three or more programs covering a particular concept. The programs are great fun to use — as well as providing real educational value.

Nine cassettes are available*





JM1 Angles

JM2 Directed Numbers

JM3 Fractions

JM4 Co-ordinates and Lines

JM5 Symmetry

JM6 Motion Geometry

JM7 Sets

JM8 Elementary Statistics

JM9 Ratio

Each cassette costs £7.00. Disc collections also available (JM1-6, £30.00; JM7-9 £18.00)

*Electron versions of programs JM1-9 and Dragon versions of JM1-6 also available.

Available by direct mail order, or from selected software dealers.

Prices include VAT and P&P (in UK).

Prices include VAT and P&P (in UK).

Carland Computing 35 Dean Hill, Plymouth PL9 9AE

I MUST admit that when the editor summoned me to his office today to see "this exciting new arcade game" I was rather worried I'd have to review just another boring version of Space Invaders, dressed up to suit the '80s.

I couldn't have been more mistaken – I was presented with a copy of the hottest thing out of a software house since Killer Gorilla!

I felt like John Wayne ready for the final shoot out. Would it beat me? The hell it would...

At first sight, Fortress by Amcom would seem to be another space game. But as just a few minutes of play will reveal, it's something quite different.

You are given command of a delta winged starfighter. Your task is to destroy the enemy headquarters and escape.

And that's no mean feat, as it's guarded by rocket launchers, gun turrets, enemy planes, force fields and so on.

Despite the opposition, it can be done, and the surprise at the end is both original and entertaining. (If I told you what it was then it wouldn't be a surprise, would it?)

However, what really puts Fortress in a class of its own is its unique 3D diagonal scrolling. It literally does make the game a new dimension in arcade games for the BBC Micro.

Accompanied by ear-crunching sound effects, the action is fast and furious enough to present a challenge to even the most hardened of video gamesters.

Control is either by keyboard or joystick, and the key set may be redefined if you so desire.

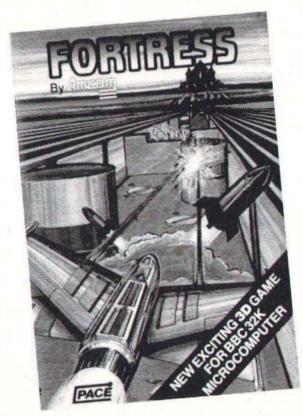
My only criticism of the game is that it tends to be a little predictable. This doesn't mean it's easy – just that it's easy to predict you're not going to last too long in your first couple of goes!

To sum up, the game is thrilling, the diagonally scrolling graphics superb and the sound effects excellent.

In fact it's so good, the editor had to unplug my Beeb to get me to write the review. Highly recommended.

Mark Lewis

Fortress – the hottest thing since Killer Gorilla!



Clue up on coordinates

IN my youth I spent many an hour with pencil and squared paper playing battleships — trying to find where my brother had deployed his fleet and to sink them before he destroyed mine.

Chalksoft's Man is a variation on that theme, in which an invisible man is hidden somewhere in a grid.

You do not need squared paper and you don't need a brother!

As in the game of battleships,

the object is to find the man as quickly as possible.

If your guess is incorrect you are given a hint such as NW or

To increase the challenge you have only a limited amount of time to locate the man.

Failure to find him is rewarded by: "Do you want another game?"

Success results in the sort of noise you associate with failure.

The program makes good use of colour and graphics, though a grid of either lines or dots would have been helpful.

The program gets all the input and does not wait for Return to be pressed. The Delete key does not erase the last character input but all of the current input string.

The hints which flash in a text window at the bottom of the screen tend to disappear just as I look down.

When tested in the classroom this program did help pupils to understand coordinates and I would recommend it, though it seems rather expensive.

John Lord

Sortie with sharks

THE title, Lemming Syndrome, conjured up all sorts of ideas and fantasies, and I was not disappointed by Dynabyte Software's interpretation.

Mad Marco, the potty programmer (does this remind you of anyone?) has blown up the bridge to the mainland and is on the rampage.

The only escape for the fleeing people of the island is to jump like lemmings into the sharkinfested waters. Which is where you come in.

As Lifeboat Lennie – well you have to be known as something – your job is to bounce the people to safety across the water on your liferaft.

You must be careful not to fall into the jaws of the awaiting sharks and you must avoid Mad Marko's attempts to blow up the

The setting is visually very attractive with vivid use of colour and sound. I especially

From Page 87

liked the shrieks from the doomed people, falling prey to the sharks and the water.

The instructions are clear and concise with many options, but the game is nevertheless fairly limited.

When 50 of the population are killed you just start your mission again.

There are five variations of speed, and an option for changing the level of difficulty. However I found the latter to be no more than an option aligned to the speed.

Feeling a little cheated, I also found that, for me at least, increased speed just made the game impossible.

I am, however, quite willing to concede that this was a failing on mine and not the game's part!

You can also choose between absolute and proportional control for your raft, and this definitely enhances the game.

Proportional control enables you to move left and right, whereas absolute control moves you to three predestined positions — to the left, middle and right of the ocean.

The latter of these two methods is the easier for rescuing people and thus provides its own variations on degree of difficulty.

This game is certainly no show-stopper. But despite its limitations I found it to have the same sort of hypnotic appeal as one of those pocket computer games that you claim to tire of very easily but can't seem to put down.

Isobel Suart

Action on angles

ANGLE, from Chalksoft, is a package of four programs which go together in pairs — a demonstration program and a program where the new knowledge is put into practice.

The first demonstration program measures angles as fractions of a turn, relates these fractions to degrees and then estimates angles in terms of degrees.

The second demonstration program shows how to use an angle indicator (a protractor to measure 360 degrees).

Angles are drawn and the angle indicator superimposed.

The angle is then read off the scale. Both programs are clear and helpful, the second particularly so.

Each contain sufficient examples to put the points across clearly.

The interactive programs use the knowledge learned from the previous program and there were no ambiguous questions.

Unfortunately there is no help if the wrong answer is given.

This package is most useful in the classroom. The development of the content is well thought out and works well in practice.

The use of graphics is excellent throughout.

John Lord

Music hath charms

LIKE the author of this program, I am also a former

teacher of the piano and have experienced the frustrations of repeating the whereabouts of middle C and so on to sticky-fingered little children.

However in Reading Music Made Easy by Childsplay it is claimed that the learner can literally teach himself, or at least with the minimum of supervision.

Having waded through numerous manuals and programs which, while they display the micro's extensive musical capabilities, do very little to threaten the jobs of music teachers, I was sceptical.

To my delight, however, I found that such hefty claims were more than met by this quite excellent program.

The basic test involved is to recognise and name a succession of notes displayed on staves drawn on the screen.

Because of the range of well thought out options, even such a basically simple program caters for a wide range of needs a capabilities.

I especially liked the way necessary instruction is d played on screen in an eas assimilated manner.

You are initially asked what facilities and information a required. The screen is then up accordingly and prompts a given asking you to demonstratif the information has be absorbed.

As a beginner you may or wish to start by learning to notes of one clef, with no leg lines. While the text is progress you are constant reminded of the names of to notes, for which there are to usual rhymes to aid memory.

As you become mo proficient, you may feel you c do without such reminders wish to add the leger lines.

You may even feel up mastering another clef befo continuing with the test.

Whatever your chosen level

QUICK RUNS A first look at some of the latest releases

Digger: Rid your garden of Footas and Pubars in this underground chase. They cannot pass through earth as you tunnel, unless they change into ghosts. Beware the fire-breathing Pubars. Pump them up until they explode, or for more points, tunnel under rocks to crush them. (Visions)



Rocky: Drop rocks on the patrolling mutant robots. They emit a yellow light from their single eye which will weaken you if it strikes. If you are not carrying a rock when caught, the mutant changes into either a spectre or a crusher to make life more difficult. (Superior)



Overdrive: A multi-stage 3D road race through night, snow, desert, and riverside scenes. To qualify for the next scene you must overtake enough cars to finish in the top 12. (Superior)



Battletank: In this 3D game you guide your tank between pyramids, sighting the enemy tanks from your turret. Their relative position is displayed on the long range scanner as you attempt to bring them within range of your gun (Superior)



Boris In The Underworld: Guide Boris through the underworld caverns in search of his stolen valuables. Fight of the underworld creatures as the walls close in on you. (Superior)

* * *

Cosmic Kidnap: Move and shoot your laser base in an attempt to prevent the alien swarm from rescuing their colleagues. Shoot them as they attempt to break into your solid jail brick by brick, but beware the evil bug as you manoeuvre under a hail of bombs. (Superior)

* * *

Pool: A simulation using six balls plus a black and a cue ball. Control the direction of the cue and the strength of the shot. The computer does the rest. (Dynabyte)

* * *

Percy Penguin: Trapped in an ice maze, you must survive the deadly Snobees as

ficulty, having achieved the get recommended by the mputer you are then set a her, yet perfectly obtainable get, and are given an analysis your previous performance. You may be thinking that ile this sounds great for the ginner it is not much use to the ore advanced musician.

A nice feature of the program, wever, is the constant time play which will measure the ed of your progress.

Thus even after a flawless formance of the most difficult m of the test you are still ormed you can improve by coming faster.

The program may not be quite valuable to the musicallyiated, but it will certainly aid the speed and accuracy of ht-reading, and test the ction time of even the most vanced musician.

There is always the incentive trying to beat the "impose" task of successively completing the given test within 12 seconds.

There is also the opportunity for developing pitch.

The program caters for a wide range of users. You may want to learn the treble clef, using the recorder or violin, or the bass clef, for cello or double bass. Then again, you may wish to learn both for the keyboard.

Learners of keyboard instruments can opt to see a visual display of the keyboard, which they can "play" by moving the cursor keys left and right. This excellent addition is impressive.

If you select this option you must not only name the notes, but also "play" them on the keyboard when you are tested.

All in all, an excellent program. The amount of time and care taken in its production, as well as the knowledge and experience of the author on its subject matter, are abundantly obvious.

Karen Torevell

Clear the board

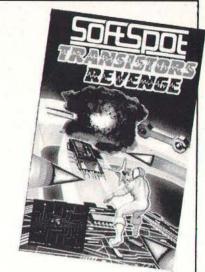
IF somebody were to tell you that your components were revolting you might be a little upset.

Well it's true, but don't be alarmed. I'm not referring to your physical attributes, but to a new game from Softspot.

Transistors Revenge is one of their latest arcade games. After *RUNning the program, which takes about three minutes to load, you are presented with a combined key plan and high score table.

The game takes place inside the BBC Micro on the printed circuit board itself, and your task is to defend the CPU from attack.

Your enemy is a force of 50 mixed micro electrical components ranging from resistors, transistors and capacitors to



diodes and fuses.

Their sole aim is to destroy the central processor, whose exalted position they envy intensely.

The screen layout is simple. The CPU is a rectangle in the centre of the screen and radiating from it towards the screen edges are the data lines.

y chase you relentlessly. Crush them th cleverly kicked ice blocks. Get three imond blocks in line for a bonus. iperior)

* * *

orse Race: Spend a day at the races.
udy form, place your bets and follow
ur chosen horse in the hope that the
key doesn't fall off. A game for one to
players which includes graphic
tail such as mobile camera, waving
ectators and tote and leader boards.
ynabyte)

* * *

ain Teasers: Six thought-provoking mes. Noughts and crosses, 3D ughts and crosses, Reversi, Masternd, Magic Squares, and Nim. All mes use Mode 7 text. (Dynabyte)

* * *

Ilti-Aid: Three utilities on one sette. Character – define and edit lticoloured characters, autotically generates VDU23 commands saving. Soundlab – parameters for en envelopes and nine sound tements are displayed in this sound

editor. Graph7 - a Mode 7 teletext editor which supports all control codes, stores up to 24 screens for later use. (Dynabyte)

* * *

3D Tank Zone: Scan the terrain around your turret and position your cross sight on the enemy planes and tanks. Wire graphics create the landscape as you try to outwit and out-shoot the enemy. (Dynabyte)

* * *

Elementary Statistics: Three different programs introducing charts to display collective information and data. Choose the most suitable method from barchart, piechart, or scatter, according to your requirements. (Garland)

* * *

Astro Maths: Educational software for the seven to 15 age group. In two parts, the program tests the child's ability on 10 problems with selectable degrees of difficulty. The program moves on to part two with seven successful answers or more. This is a space shoot out game destroying the aliens by accurate positioning of the cross sight and laser fire. (Scisoft)

* * *

StudyMaths 1: Educational software for the nine to 13 age group which incorporates five different mathematical programs. Symmetry – drawing shapes. Fractions – which shape is the bigger? Shapes – name the shape. Factors – select the factors of a number from 10 given numbers. Battleships – a coordinate game. (Scisoft)

* * *

Confrontation: A strategy war game for two players. Using a pre-recorded scenario, or creating your own, activate and position your air and land forces in an effort to reach your own agreed preset victory conditions. (Lothlorien)

* * *

Jungle Jive: Taking a walk through the jungle, you are under constant attack on both sides from a variety of brightly coloured animals. Armed with only a rifle you must shoot them to survive to the next screen where you meet different animals as the game gets faster. (Virgin)



COMPUTING NEWS

A **GSL** COMPUTING PUBLICATION

GSL'S MONTHLY PRICE REVIEW

MICROS

BBC Model	B	32K	£346.96
BBC Model	B	with	D/Interface 32K £433.00
			Econet 32K £389.14
BBC Model	В	with	Disc & Econet 32K £480.00

MONITORS

Microvitec 14" Colour	£215.00
Decca 14" Colour	£190.00
Kaga Green screen 12"	
Novex Green & Amber screen	£105.00

PRINTERS

NEC PC-8023 BE-N dot matrix	£320.00
Epson FX80 dot matrix	£405.00
Juki 6100 daisywheel printer	£399.00

DISC DRIVES

100K Shugart disc drive	£140.00
200K Shugart disc drive	£235.00
400K Shugart disc drive	£260.00
Hitach 3" 100K disc drive	

- Notice to Dealers -

Hitachi 3" Disc Drive TEC 51/4" 100K Disc Drive

Please contact Rod Lewis or Glenn Ward for Dealer Prices

UPGRADES

Acorn Disc upgrade Kit£1	15.00
Amcom Disc upgrade Kit£1	15.00
Econet interface Kit£	
Speech interface Kit £ 5	
Wordwise wordprocessor package£ 3	
Disc Doctor pack£ 3	

BEEBSCOPE

Enables the BBC to function as a two channel, large screen, storage oscilloscope. For scientific, educational or home use.

£350.00

GSL's Monthly Stock Offers

Oric Computer £110.84

Torch Z80 Disc Pack inc. £1000 free software.....£730.00

The above prices exclude carriage and V.A.T.

We are an authorised County Council Dealer & Service Centre

We are an official Acorn Dealer and Service Centre

Tremendous opportunities for those wishing to become GSL Appointed Dealers

For further details please Contact Rod Lewis on Andover (0264) 59633

GEOPHYSICAL SYSTEMS COMPUTING LTD West Portway Industrial Estate, Andover, Hampshire SP10 3SG Telephone: 0264 59633 Telex: 47166

SOFTWARE SCENE

From Page 89

The enemy makes random attacks along these lines. You defend the CPU by moving from pin to pin and firing electronic pulses.

Should any component succeed in reaching your stronghold the CPU explodes in a mass of sparks, you lose one of three lives and start again.

A variety of tools – pliers, hammers, drills, and spanners – appear occasionally at the edges of the board.

They can do you no harm but if you can destroy them you collect bonus points. They take some hitting because of the speed at which they disappear.

Occasionally a mains spike appears which cannot be destroyed as it zips towards the CPU. However it will only kill you if it hits your fire pointer.

In cases of extreme pressure you have a Zap button available which will clear the board of everything in sight. But beware, it takes 20 seconds to recharge itself.

Each time you clear the board of the enemy a fresh onslaught appears and the game speeds up. After four cleared boards the printed circuit layout changes.

You score 100 points for every component hit, and a bonus of 500 for each tool you strike.

You gain one extra life when your score has reached 50,000 points.

A novel idea is that when the game is over you are given the option of entering the high score table or carrying on a new game from where you finished the last.

The program makes excellent use of graphics and sound and is

infuriatingly addictive. Refinements such as a freeze game facility and a sound on/off option add to its professional quality.

All in all it is good value for money, is attractively packaged and the written instructions are clear and precise.

The verdict from my four young sprogs who played the game for hours between them was "Ace!".

Alan Sergeant

Off into the wide HAVE you ever daydreamed that you're the pilot of a World Blue you're the pilot of a World HAVE you ever daydreamed blue yonder...

that you're the pilot of a World War II Spitfire, barnstorming bridges, straffing buildings, and generally scaring the wits out of yourself?

Do you still get a lump in your throat when you see the nth rerun of Reach for the Sky?

If so, Acornsoft's Aviator package is the one for you.

Seated in the cockpit of what must be the most accurate and complete flight simulator yet produced for the BBC Micro, you can fulfil your heart's desire without ever leaving your armchair.

Included in the package is a 25 page manual, a large map and a keyboard plan.

The controls are well thought out and the manual is explicit and to the point, containing enough information to make you feel like a real pilot.

On loading the screen presents a 3D view of the runway, with the plane ready for take off. One quick consultation



with the manual and you're in the air.

Not that I managed to stay there very long at first, but with practice you soon get the hang of it.

The screen display is in Mode 5 black and white, so the

instruments aren't too well defined. But as the program takes up so much memory it's hard to see how this could be improved.

Apart from this minor moan, the rest of the graphics are superb. Onlookers – and you'd better be prepared for lots of them – groaned with anguish as the simulator barrel-rolled at the hands of this maniac reviewer.

Not only did the engine tone fall and instrumentation flay wildly about, but the landscape, bridges and so on all turned realistically — as did my stomach!

Having regained some semblance of control I headed west across the river to the next test of my skill – flying under the bridge.

With a scream of "Geronimo" I set the Spitfire

The Micro User Index of software reviews

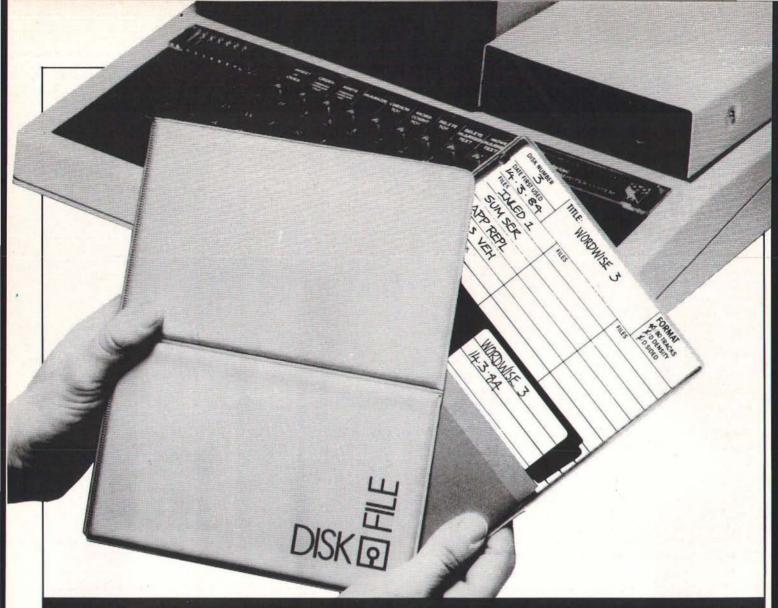
3 Deep Space (Postern)	. Feb 1984
3D Bomb Alley (Software Invasion)	Jan 1984
Action of the Heart (Garland)	Sep 1983
Aid (Lincoln)	. Jan 1984
Alien Destroyers (Program Power)	Aug 1983
Alphabeta (H & H)	Mar 1983
Animat/Vegetable/Mineral	
(Bourne Educational)	. Oct 1983
Apollo (Software Invasion)	May 1983
Arcadians (Acornsoft)	Aug 1983
Atlantis (IJK)	Mar 1983
Beebcalc (Gemini)	Sep 1983
Beebsynth (Clares)	Nov 1983
Billiards (H & H)	Mar 1983
Bridge to the East (Ixion)	Mar 1984
Bun Fun (Squirrel)	Aug 1983
Business Games (Acomsoft)	Mar 1984
Canyon (BBC Soft)	. Oct 1983
Cashbook (Gemini)	Aug 1983
Castle of Riddles (Acomsoft)	. Jan 1984
Chess (Bug Byte)	Apr 1983
Chess (Acornsoft)	Dec 1983
Chess (Computer Concepts)	. Dec 1983
Chickaroo (Screenplay)	May 1984
Circus (Digital Fantasia)	Jan 1984
Colossal Cave (Level 9)	Feb 1984
Commercial Accounts (Gemini)	Jun 1983
Community (Ixion)	
Connect 4 (Database)	. Apr 1983
Countdown to Doom (Acornsoft)	. Jun 1983
County (SM) (Bryants)	
Cylon Attack (A & F Software)	. feb 1984

Datext (Optima)	Jan 1984
Delivery (Paean Systems)	Apr 1984
Jevil's Causeway (Kaydee)	Sep 1983
OFS (Amcom)	Sep 1983
DFS (Amcom) DFS (Watford)	Sep 1983
JFS (Amcom)	. Oct 1983
Disc Executor (Vision Software)	Jan 1984
Oragon Rider (Salamander)	Oct 1983
asy Crasher (Salamander)	May 1984
CFG (Gaelsett)	May 1983
scape from Moonbase Alpha	
(Program Power)	Apr 1984
scape from Orion (Hopesoft)	Nov 1983
ssential French Verbs (Carsondale)	Dec 1983
acemaker (Ask)	. Jan 1984
irehawks (Postern)	Dec 1983
orth (Level 9)	Nov 1983
ranklin's Tomb (Salamander)	
rogger (A & F Software)	Mar 1983
ungames (BBC Soft)	Apr 1983
un to Learn (Shard's Software)	
Salactic Firebird (Konsas)	Nov 1983
Serman Sentence Practice	
(Educated Owl)	Dec 1983
inouts (Program Power)	May 1984
Grafkey (Clares Soft)	Apr 1983
reat Britain Ltd (Simon Hessel)	Jun 1983
unsmake (Software Invasion)	Nov 1983
lide & Seek (Ask)	Jan 1984
lome Finance (BBC Soft)	May 1983
lopper (Acornsoft)	Sep 1983
Inrror Castle (A & F Software)	May 1984

Hunchback (Superior Software)	May	1	984
Hyperdrive (IJK) Inheritance (Simon Hessel)	Jun	1	282
Invaders (IJK)	Mar	T.	983
Invaders (Suftware Invasion)	May		
Jigsaw (ega beva)	May		
Junior Maths Pack (Program Power)	Oct		
Let's Count (Ask)	Jan		
Love and Marriage		1	
(Acornsoft/Ivanberg Software)	May	14	984
Lords of Time (Level 9)	May		
Marklist (Optima Software)	Anr		
Mary Rose (Ginn)	Jan		
Missile Base (Acornsoft)			
Music (BBC Software)	Apr		
Music Editor (System)			
Music Synthesiser (Bug Byte)	Jul		
Number Puzzler (Ask)	Jan	15	984
Oblivion (Bug-Byte)	Apr	15	984
Old Father Time (Bug Byte)	Jan	13	984
Omega Probe (Optima Software)	May	15	984
Package 004 (Software Invasion)	Jon		
Paintbox (Oakleaf)	Mar	15	184
Painter (A & F Software)	May	15	983
Pascal, Sequences, Puncman			
(Chalksoft)	Nov	15	983
Peeko-Computer (Acornsoft)	Feb	15	384
Pengo (H Solt)	Feh	15	984
Philosopher's Quest (Acornsoft)	. Jan		
Physics (Program Power)	Dec	15	983
Physiological Simulation (Fiveways)	Dec	15	183
Pimania (Automata)	Mar	15	184

Printer Monitor (Watford)		1984
Programs I (BBC Soft)	. Apr	1983
Rocket Raid (Acornsoft)		1983
Screen Dump (DACC)	Mar	1984
Sea Lord (Bug Ryte)	Anr	1984
Shrinking Professor (A & F Software	Apr	984
Slick (BP Educational)	Jul	1983
Snapper (Acornsoft)		1983
Snooker (Acornsoft)	. Oct	1983
Snowball (Level 9)	Feb	1984
Space Pirates (Bug Byte)	Mar	1983
Sphinx Adventure (Acornsoft)		1984
Spreadsheet (Microl)	Nov	1983
Sprite-Gen (DACC) Spy (System)	. Dec	1983
Spy (System)	Nov	1983
Star Maze II (Kaydee)		1983
Starship Command (Acornsoft)		1983
Supergolf (Squirrel)		
Swoop (Program Power)		1983
Taxcalc (BBC Soft)		1983
Tess (H & H)		1983
The Grange (Dobsoft)		1984
Timeman One (Bourne Educational)		1983
Toolbox (BBC Soft)		
Vu-File (Psion)	Nov	1983
White Knight (BBC Soft)		1983
Wordhang (Bourne Educational)		983
Wordwise (Computer Concepts)		1983
Zany Kong (Solar Soft)	Sep 1	983

Need a back number? You can order with the form on Page 165.



The Best Thing Next To Your Disk Drive

Proper care of your diskettes is essential to the well-being of your disk drives.

Dirt or grit on the diskette might wreck an important file and could mean expensive damage to the drive itself.

Storing your diskettes in a Personal Disk File protects them and creates an accessible and well organised library system too.

Each wallet is made from a strong but flexible vinyl to protect your valuable data. The double sided leaves enable up to 20 disks to be stored in each binder.

Every pocket is provided with an individual index card with spaces for format, files and your disk to disk back-up record. The leaves have roomy pockets to accept standard 5 ¼ inch or 3 inch mini disks.

A special easel mechanism enables the Personal Disk File to stand for convenient access. The beige covers match your BBC and many other computers or drives. The Personal Disk File comes complete with 10 inserts to hold 20 disks and their index cards.

Don't take chances, store your diskettes the right way now!

Direct by return of post from SOFTEACH or from good computer stores.

To SOFTEACH LIMITED , 25 College Berkshire, RG6 1QE.	Road, Reading,
Please send me:	
Personal Disk Files Con and 20 index cards at £9.	
(Overseas should add 25% for addition	onal surface mail)
I enclose a total remittance of & order payable to SOFTEACH LIMITI	cheque/postal
NAME	
ADDRESS	

SOFTWARE SCENE

From Page 91

into a 250mph dive from 4,000 ft straight for the bridge.

Needless to say that attempt failed miserably. However, I did manage it eventually.

Some way to the south west of the airstrip lies the sleepy little hamlet of Acornsville.

Surrounded by open fields and beautiful rolling countryside, it's the ideal place to practice your aerobatics - if your nerves are up to it.

And you'll want to practice in the main program, points are scored for performing tricky manoeuvres such as flying under bridges, flying between buildings and landing.

For the more ambitious, double points are awarded for completing the flying manoeuvres upside down! (The plane, that is.)

If all of this wasn't enough, Acornsoft have included a games theme in which you try to save the occupants of Acornsville from marauding

intruders from outer space.

Rather odd in a Spitfire, that, but still, it's the game that counts.

Just to spice things up a little, the game is played in real time. So I would advise you to learn to fly the thing before you attempt this final challenge.

Sadly, space just does not allow me to elucidate further on my exploits with this truly excellent simulator.

Suffice it to say that Aviator is a very exciting game to play, and should give hours of pleasure to all budding pilots.

Marcus Adams

New look at invaders

A FAIRLY novel variation on the Space Invaders theme is Cosmic Kidnap by Superior Software, in which you are the Autoguard in sole charge of a space jail.

Your captives are the three



most important aliens that ever existed and your aim in life is to prevent your precious guests from being rescued by their alien comrades.

The game is simple in concept. There's the normal laser base (your blaster), which you can move left and right at will, dodging between the shields. In the centre of the screen is the jail, enclosing your charges.

The aliens steal in from the edges of the screen, rapidly removing the building blocks of the jail, at the same time dropping bombs on you.

If any alien gets to a captive and manages to remove him you explode and lose a life - in addition to any you have lost by being bombed.,

At regular intervals the alien mothership zips across the top of the screen. You hit it for bonus points.

My only criticism of the game is the ear-splitting shrill whistle that the ship makes as it travels across the screen. It really is oppressive, although I suppose if you got deeply involved with the game you could ignore it after a while.

On clearing a screen you are met by a new swarm of aliens intent on rescue, and in later stages additional enemies appear presenting new problems.

If you think the Space Invader genre is dead, try this one. It's an unusual version that kept my kids enthralled for hours.

Alan Sergeant

THE SIR ROM/RAM EXPANSION BOARD MODEL 2 THE ULTIMATE ROM/RAM EXPANSION SYSTEM FOR THE BBC MICRO

- ★ 12 extra ROM sockets complement those already provided by the micro to allow up to 256K ROM
- Four of these sockets can support either ROM or Static RAM (up to 16K maximum RAM).
- The Model 2 board allows switching between multiples of 2K, 4K, 8K or 16K ROM/RAM.
- Fully compatible with all ROMs, including LDOS, Aries B20, and TORCH Z80 2nd processor card.
- ★ NO soldering, plug-in design.
- Fits easily inside BBC case.
- Plugs into CPU socket via short flexible connector.
- Improved plug design allows the Model 2 board to connect securely to any type of BBC CPU socket with no harm to micro or board.
- * Board is held in place by sturdy supports.
- * Full instructions provided.
- Additional features include the ability to transfer paged firmware to disc, and then load back into sideways RAM for future use - giving you no limit to the number of effective ROMs accessible!

SIR BBC MICRO ROM/RAM EXPANSION BOARD (Model 2): Price £49.95 DISC DRIVE

BBCMICROCOMPUTER
BBC Model B£399.00
BBC Model BD£469.00
PRINTERS
Dot Matrix:
Epson FX-80£389.00
Epson RX-80 F/T£275.00
Shinwa CP-80 £263.35
Daisywheel:
Juki 6100£399.00
MONITORS
Sanyo B/G£85.00
Microvitec RGB F229 00

Single 100K£149.00
Dual 100K£279.00
Dual 400K£449.00
We have over 200 titles currently in stock
including ROM based programs such as:
VIEW£59.80
HCCS PASCAL£49.50
GRAPHICS ROM£32.20
WORDWISE£39.95
DISC DOCTOR£29.95
Please telephone for full details of our software
range.

BUSINESS SYSTEMS

Torch 780 Disc Pack:

This powerful and sophisticated unit interfaces with the BBC Micro to create a comprehensive business system. The Disc Pack includes: Twin 400K drives; Z80 second processor; 64K RAM;

NOW WITH FREE SOFTWARE

(Wordprocessor, database spreadsheet & business simulation). The full system is available for **only £799.00**.

All our prices are inclusive of VAT unless stated otherwise

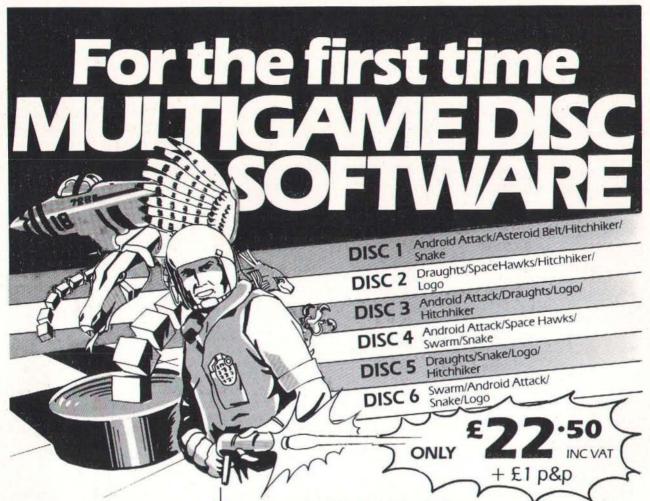
Postage and Packaging: Please add £10 P&P (large items: Printers, Monitors, etc.). Small items: ROM Boards, Disc Drives, etc. FREE

Access/Barclaycard Telephone orders welcome.

SIR COMPUTERS LTD. 91 Whitchurch Road, Cardiff CF43JP Telephone: CARDIFF (0222) 621813





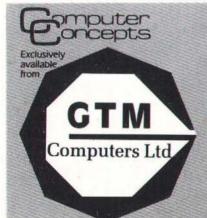


The Greatest Games on Cassette!

Draughts	£8.95	inc VAT + 50p p&p		p&p	
Asteroid Belt	£7.80		*		
Android Attack	£8.95				
Space Hawks	£7.80				*
Snake	£7.95				٠
Games Galore	£8.95		×	ž.	À
Swarm	£8.95				
Logo 2	£10.00				*

Rom Expansion Boards making a full 16 Roms available





Dealer Price List for Disc Drives

Single 100K 40 trackdrive

1301	Single Took to trackdrive	2111.33 1 L1.30 pap
PSD 2	Single 200K 40 track double sided	£243.80* + £7.50 p&p
PSD 3	Single 400K Double sided 80/40 Track Switchable	£282.90* + £7.50 p&p
PSD 4	Single 80 track double sided non switchable	£247.23* + £7.50 p&p
PSD 5	Single 80 track single sided Switchable Drive	£258.75 + £7.50 p&p
PDD 1	Double 200K 40 Track Drive	£338.10* + £9 p&p
PDD 2	Double 400K 40 Track Double Sided	£483.00* + £9 p&p
PDD 3	Double 800K Double Sided 80/40 Track, switchable	£573.85* + £9 p&p
PDD 4	Double 80 Track Double sided non switchable Drives	£479.55* + £9 p&p
PDD 5	Double 80 Track single sided switchable drive	£501.40* + £9 p&p
	Diskettes Single Sided	£19.95 + £1 p&p
	Diskettes Double Sided	£39.95 + £1 p&p
A 440	description of the NAT Complied appealance with many of public and bound so	ad forus

£171 35* + £7 50 p&p

* all our prices include VAT. Supplied complete with manual, cables and boxed ready for use.

Dealer Enquiries welcome – contact George Turnbull on 0532 647474

Ref No	Product Price
	PO for total amount or debit verard account No Total
Signed	Name



Grapevine is simply the most versatile modem available, at the price, for home or business use. It offers Viewdata/
Prestel band rates (1200/75) alongside 300/300 baud full duplex for communication between the BBC and other computers.

Grapevine offers both European and Bell frequencies for compatability with American Databases and standard European CCITT systems.

The state-of-the-art modem chip technology employed requires minimal support circuitry and this results in low power consumption, low cost, high quality and extreme reliability.

Grapevine is 'hard wired' to minimise the risk of 'noise interference' errors which are common to outdated Accoustically coupled devices. Grapevine also features a comprehensive self test facility to facilitate easy installation.

Grapevine utilises RS232/RS423 interface standards with a 5 pin domino din connector. It is supplied complete with the appropriate lead for connection to the BBC micro, other leads are available on request.

The BBC microcomputer requires communications software to operate Grapevine. This is provided by Commstar, the intelligent communications eprom from Pace. Commstar is extremely flexible and provides numerous commands to transmit, receive, save, load or transfer data. By using Commstar it is possible to access Prestel, Micronet, Homelink, Telecom Gold, and various 'Bulletin Boards' throughout the country. Commstar can be used to emulate other terminals simply, (e.g. VT 100), by means of a configuration disc.

The complete Grapevine/Commstar package, for the BBC which includes the Modem eprom, all cables and manual is just £139 plus VAT.

Please telephone for a comprehensive fact sheet.



92 NEW CROSS STREET. **BRADFORD BD5 8BS.** Tel. (0274) 729306 Telex 51564

This modem incorporates the very latest in communication technology and is therefore not yet B.A.B.T. approved.









THE BEST BBC

* PRODUCED BY AN INDEPENDENT SOFTWARE HOUSE Y



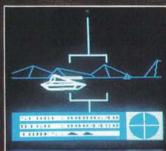




R novel arcade-style game in which you take the part of Boris, who has had his home raided by the underward creatures. They have stalen most of your possessions and your task is to venture into the underward to retrieve your valuables by fighting off the underward creatures. The walls of the underward dose in and you will be vapourised if they touch you. Can you retrieve all of Boris's possessions from the underward?

•••NELLI RELEASE••••



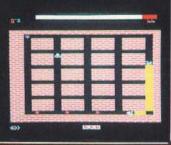


BATTLETANK (SEK)

An excellent game, made possible on the Bl computer only by the unique use of a dual-sare display and specially written plotting routing You are a tank gunner looking out onto a mounto plateau. You see the distant mountains and if pyramid obstacles — and also the enemy tar Position the tank in the rectangular viewfinder I fine adjustments of your controls, then fire!

(KEYBOARD or JOYSTICKS).

•••NEW RELEASE•••



ROCK (SSK)

A new concept in accode-style games. Your task is to save yourself from patrols of mutant robots by dropping rocks on them. Each of the robots has a single large eye which emits a yellow beam of light. Being cought in this beam reduces your strength and, if you are not carrying a rock, causes the robot to metamorphose. It may change into either a spectre or a cruncher.

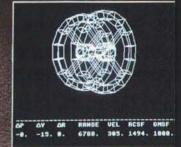
(KEYBOARD or JOYSTICKS)

•••NEW RELEASE•••



sheet not only does the speed increase, but als the number of meteors, space-mines, enem spaceships, and fireballs. •••NEW RELERSE•••





A space docking simulator using 3D graphics model the motions and responses of the ORIOT spacearaft. Your mission is to pilot the shuttle to "soft dock" with the space station. PTCH, VRI ROUL, FORWARD, LATERAL and VERTICAL enginere provided together with orbit monoeuver booster engines. 6 skill levels provide for tompletely inexperienced pilot as well as the ful fledged commander.

OTHER TITLES AVAILABLE:

SPITFIRE COMMAND	£7.95	ALIEN DROPOUT	£7.95	PLANETARIUM	£7.9
MISSILE STRIKE	£7.95	GALAXY BIRDS	£7.95	MIRGROUND	£7.9
CENTIBUG	£7.95	INVADERS	£7.95	FRUIT MACHINE	£7.9
FROGGY	£7.95	SPACE FIGHTER	£7.95	STRANDED (Adventure)	£7.9

WE PRY UP TO 20% ROYALTIES FOR HIGH QUALITY BBC MICRO,



SUPERIOR SOFTWARE LIMITED,

Dept. BMU5, Regent House, Skinner Lane, Leeds 7 Tel: 0532 459453

- OUR GURRANTEE

 (1) All our software is available before we advertise.
- All our software is despatched within 48 hours by first-class
- post,
 (3) In the unlikely event that any of our software fails to load, return your cossette to us and we will immediately send a replacement.

NICRO SOFTWARE

TOP QUALITY MACHINE-CODE PROGRAMS *







est version available for the BBC micro, Perqueged in an ice maze which is populated by the ly Snobees. His only hope of survival is to the them by hurling ice cubes at them tunately, whenever itseems that he has won, ad



HUNCHERCH (32M)

An excellent version of the arcade game where Quasimodo attempts to rescue Esmeralda. Beautifully detailed animation as Guasimodo leaps over the ramparts. Twelve different screens of action! This program is sold under licence from Ocean; we have exclusive rights to its sale for use on the BBC micro. (KEYBORRD or JOYSTICKS).

extremely good version of the arcade





In July full-facture version available for the BBC. On the first screen, you take the part of a sy being chased by African tribesmen. The screen features the mankey trying to reach inch of bananas. After that, you take control of iteraller and each square painted-in adds to

core.
IOARD or JOYSTICKS),
It sound and graphics, smooth and accurate
Ition, responsive and simple controls..."
ECOMPUTING WEEKLY



The only full feature machine-code version available for the BBC micro. Features include: scrolling screen, radar display, 3 pursuing cors. theckpointflags, fuel gouge, smoke screens, 6 skill levels, rankings, increasing difficulty, and sound evels, rankings, increasing effects. (KEYBOARD or JOYSTICKS).

game becomes very hard and has very tharaphics Excellent." BEEBUG MAGAZINE



This is a 2-player deep-space doglight. You each have a limited amount of shield energy to protect you from the other player's loser shots. You can increase your shield energy by collecting the fuel pods dropped by the flying sourcer, but your shields will be weakened if you collide with the

saucer or the wall snake ● ● ● NEW RELERSE ● ● ●



R TITLES AVAILABLE

TCITY (Adventure)	£7.95	GNASHER	£6.95	REVERSI	£6.95
TREK ADVENTURE		NEUTRON	£6.95	CRIBBAGE	£6.95
EON'S GAMBLE (Adventure)		LADDER MAZE	£6.95	PONTOON	£6.95
DITT ODVICATION	C7.0F	DOOLIGITE	CAOE		

COMMODORE-64, AND ORIC PROGRAMS. LECTRON,

DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...DEALERS...

Our software is now available at all good dealers including:

Selected branches of W. H. Smith, Boots, John Menzie's, and Greens at Debenhams.

All major computer dealers — Eltec Computers, Micro Management, West Coast Personal Computers,

Microstyle, Electronequip, 3D Computers, Computerama, GTM Computers, etc. Our software is also available through all the major distributors, and directly from us by mail-order.



MIKE COOK'S PROBLEM PAGE

I HAVE recently bought a BBC Micro and I find that when it is generating sound, interference is seen on the television screen in the form of lines rolling vertically.

At the shop where I purchased it a second machine was found to do the same.

This interference is especially visible on a red background.

The retailer told me that on ringing Acorn they were informed that this interference does not constitute a fault.

I'm rather reluctant to believe this because two workmates who also own BBC Micros don't seem to have this problem.

What I would like to know is whether this "sound on vision" interference is displayed by all machines and the possible cause of it.

This interference is seen clearly when running the "Music" program on the demonstration tape. – S. Anwar, Coventry.

 This appears to be a fault with some combinations of computers and TV sets.

The "Acorn cure" is to cut the power lead going into the modulator and to insert a 10 ohm resistor into it. Then connect a 100uF capacitor between the modulator side of the lead and the modulator case.

This should smooth any supply ripple getting into the

Curing annoying sound on vision

modulator and help reduce the interference.

My cure is to solder some wires from the power lead directly to IC 19. Pin 4 of this IC should be wired up to the 0 volts lead and pin 6 to the +5 volts lead.

This reduces the impedance of the power supply as seen by the audio amplifier, thus inducing less interference for the modulator to pick up. In extreme cases you might have to do both.

Harnessing 8in discs

I REFER to your article in the January 1984 issue of *The Micro User* concerning the Acorn DFS.

What has prompted me to write was your remarks about 8in floppy discs being used on the BBC Micro.

Naturally Acorn were not forthcoming, but I and many others would greatly appreciate an article on how to connect them up as I have a beautiful pair of Memorex 8in drives complete with PSU and I know two friends of mine who have similar drives — IBM and Shugart — waiting to fit them.

I have been using a pair of Shugart $5\frac{1}{4}$ in drives (35 track though) since June 1983 but my filing system is becoming too large -1,400 discs actually in use and a further 720 8in discs awaiting use!

I would greatly appreciate a reply or better still an informative article in *The Micro User.* – *Graham Sawyer*, *Stapleford*, *Notts*.

• It is possible to use an 8in drive with the BBC Micro, but a few links will have to be changed and tracks cut.

Having done this the Acorn disc filing system will not allow you to use the full capacity of the disc.

To the rescue comes Vogan Products, The White House, 21 Grove Road, Hazlemere, Bucks. HP15 7QY. They produce 8-DFS which is an eprom disc filing system for 8in drives. They say the product is compatible with the Acorn DFS and written with Acorn's complete cooperation. The documentation describes the modifications that need to be made.

The extra space is created by making the 8in disc look like two drives to the software by having two directories.

I hope this helps you to cut down on your disc consumption.

An eye on the PSU

AN increasing amount of software is now becoming available in ROM or eprom and there is only limited space in the BBC Micro to fit them.

As the system can support up to 16 sideways ROMs several firms are now producing add-on sideways ROM boards to allow for all 16 ROMs to be fitted at once.

I am a little concerned about

A FEW bugs seem to have crept into some of the Body Build circuit diagrams. In the March 1984 issue of The Micro User, Figure II shows VR1 as 100K. It should be 100R, as stated correctly in the parts list.

Also some of the ZN427 ICs will work even faster than the clock adjustment provides for. If this is the case with yours you can reduce R4 to 75R or even remove it altogether, replacing it with a wire link.

The real time clock in the February 1984 issue has a few problems as well. The four data lines D0 to D3 have been transposed on

the diagram on Page 117.

So the connection labelled D3 should read D0 and D2 should read D1, etc. To make matters worse, in the kits there was an error on the first issue of the printed circuit board.

Look under the battery, and if it says RTC1 then you need to do a small mod to stop the battery discharging when it is left connected to a switched off computer.

Remove resistor R1 and resolder it across the diode marked D2, either on top or on the copper foil side. If you have the second issue board with RTC2 on the underside of the printed circuit there is no need to bother.

The component suppliers presented us with a mixed box of BC182 and BC182L transistors.

The two transistors are identical except for their pinout.

As the board was laid out for the BC182 an errata sheet was included in the kits. You should check carefully which type of transistor you have and only take notice of the sheet if you have the BC182L.

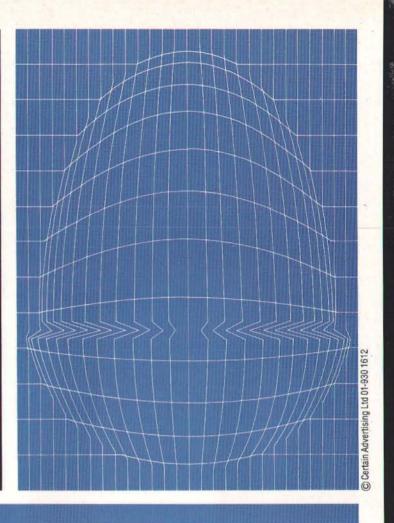
THIS IS THE BIG ONE!

The 2nd Official Acorn User Exhibition

Everything for the BBC Micro and Electron user

OLYMPIA 16-19 AUGUST 1984

Organised by Computer Marketplace (Exhibitions) Ltd 20 Orange Street, London WC2H 7ED



BIG VALUE

The success story of Acorn Computers, the BBC Micro and Electron is mirrored by suppliers who have produced more and more hardware, software, supplies and services. And they'll all be at the exhibition – disk drives, plotters, printers, monitors, joysticks, robots, books and magazines, all kinds of software – everything for the Acorn owner.

And of course Acorn will be there in force with all their latest developments and software.

There'll be special offers, competitions, advice centres and special events as well.

And all this for only £3.00 at the door, under sixteens £2.00. (Use the coupon to beat the gueues and save £1.00).

BIG VENUE

Olympia 2 is the brand new exhibition centre next to the old Olympia. It's got everything, wide gangways, lots of space to sit down and rest, plenty of catering areas.

Getting there is easy too, its got its own tube station, bus routes 9, 27, 28, 33, 49, 73 and 91 go right pass the door, and there's car parking too!

BIG SUPPORT

Remember this is the Official Acorn User Show, it's the most informative prestigious and influential user show in the country. Whether you're a businessman, serious user or games enthusiast there's something for you.

For details of exhibition stands and advance ticket sales contact the organisers.

Computer Marketplace (Exhibitions) Ltd. A Rushworth Dales Group Company, 20 Orange Street, London. WC2H 7ED Tel: 01-930 1612

BEAT THE QUEUES! SAVE MONEY! ORDER YOUR TICKET IN ADVANCE.

Buy your ticket now and save queing. There will be special entrances for advance ticket holders.

	or more tickets and you qualify for a further 20% discount.
ADDRESS	
NAME	SIGNED
to the value of £	or debit my Access card. No
Please send me	(qty) tickets at £2.00 and (qty) under sixteen tickets at £1.00. I enclose my cheque

From Page 99

whether the PSU can take the extra load of all 16 ROMs in addition to my disc drive which is already powered from the power outlet of the micro.

Presumably if I converted my single drive to a double drive this would further increase the load.

A dealer told me that it should be all right, but didn't seem to be very sure and finally said that he hadn't vet tried it himself.

Could you please let me know if 16 ROMs and dual disc drives (modern slimline type) are likely to overload the PSU of the BBC Micro? - Michael Lowe, Loughton, Essex.

· A dual disc drive alone is likely to overload the internal power supply, as sometimes it cannot cope with surges that occur when the drives turn on.

A symptom of overload is unexplicable disc errors or the machine freezing up.

It is unusual for this to cause permanent damage to the machine although obviously the machine will not work reliably.

Conversion connections

I HAVE recently upgraded my model A to B using a conversion kit from one of your advertisers and with reference to your article in the April issue of The Micro User.

The following points were not made in the magazine text (but maybe in the kit instructions):

□ 1. STROBE Q11(c)→PL9, pin I should be pulled up with 2k2. Connect between IC27 p4 and Q11(c) - middle pin of the three. This is R170. Check also continuity between Q11(c) and PL9, pin 1.

□ 2. Track to PL9 pin 23 should go to pin 19. This line should also be pulled with 4k7. Use the two plated through holes adjacent IC70 pins 11/13. This is R162. The circuit on page 503 of the User Guide shows this correctly.

☐ 3. Some printers (Microline 80, Star Gemini 10-x) object to the OV on p.26 of PL9. Isolate this pin under the socket, thus maintaining buss continuity on PL9. P26 should be isolated on both sides - it also sees OV from IC83.

Again the User Guide correctly shows this connection not made.

The above refers to issue 2 and 3 boards only. Issue 4 and 7 should be okay.

Any articles on printing in the pipeline? - C.J. Young, Kings Norton, Birmingham.

• Thank you for your help, it might clear up some problems if you had one of the early computers.

The extra operations were not part of the upgrade from a model A to a model B but rather minor fixes to the Issue 3 board. None are strictly vital.

☐ 1: Provides a pull up resistor for those printers not having one at the receiving end.

☐ 2: Helps stop the buzzing noise in the speaker found on some Issue 3 boards.

☐ 3: Is for fussy printers.

Chips in spot 69

I HAVE a cassette game by Acornsoft bought for me with the best intentions. However I have a BBC Model A partly upgraded to 32k.

Consequently it will not load, but tells me that IC 69 is missing. Since my machine is a Model A this does not surprise me.

I also assume that whatever chip it is will normally be part of the full upgrade.

I am not wanting a full upgrade because a printer is far too expensive.

Therefore can you please answer the following questions:

- What IC goes into position 69?
- . Is that all I need to allow me to use the Acornsoft cassette, or and other proprietary sort?
- Who can supply me with the

appropriate chip? - A. Fletcher, Lowton, Warrington.

In answer to your three questions, IC69 is a 6522 VIA chip, this is all that is needed, and you can get it from Watford Electronics.

Not on the air

AS the BBC Micro transmits a strong carrier slightly less than 28.0MHz must we all buy CB radio licences or has Acorn a suppression system to prevent illegal transmissions?

The carrier appears when almost any program is run and without the need for VDU or any peripherals to be connected. - Martin T. Pickering, Bedale, North Yorkshire.

• The BBC Micro produces considerably less radio frequency interference or "hash" than most other computers. No licence is needed.

Teletext adapter

CAN you tell me whether I have to purchase the Teletext adaptor to enable me to receive and record on cassette BBC teletext computer programmes?

Seeing that I already have a Sony teletext set surely a much simplified unit (and much less expensive) should do the job.

The Sony set has provision for a video recorder and I wondered if BBC Micro video out plugged into this would improve display quality - W.A. Slade, East Ham, London.

My motto has always been

that anything can be interfaced to anything else.

However to modify an existing teletext decoder to interface with your computer you would need to isolate your TV from the mains with a large transformer.

Then you would have to tap into the RAM on your teletext by inserting data select switches on the address lines and buffers on the RAM output lines.

Having done this you would then need to feed it into your computer through two VIAs interfaced to the IMhz bus. Finally you would need to write the software to drive the modification.

All in all this is a major and complex project, and not worth the effort in both time and cost.

* * *

I AM interested in the Beeb Body Building kit number four. Do I need packs 1 and 2 to go with it - I have the BBC model

Also are wiring instructions for the same included. - C.C. Kellam, Sheffield.

· Yes you do need the packs. To find out exactly how to use them you'll need the July 1983 issue of The Micro User.

* * *

I WOULD be most grateful if you could tell me how the BBC Micro can distinguish between ROMs and eproms in its language sockets, as the enable lines for ROMs are positive to select and negative to select for eproms. - W.H. Walker, Leighton Buzzard, Beds.

• You are wrong. The select line for both ROM and eprom is negative to select.

FOLLOWING the letter entitled "Look, no mods!" in the January 1984 issue of The Micro User I wonder if your super sleuths could find out the serial numbers of the boards which were screen printed "Issue 3" when they were really of the "Issue 4" variety.

Such information could determine whether a DIY approach becomes a possibility or not. -E. Atkinson, Keighley, West Yorkshire.

• There are lots of changes in the layout between an Issue 3 and Issue 4 board. Perhaps the easiest to spot is the small plastic

block - usually blue or yellow on the very edge of the board next to IC98.

This IC will just be an empty socket unless you have the speech chips fitted. It is to be found on the left hand side of the board about half way up.

If this block is missing you have an Issue 3 board. Page 64 of the April 1983 issue of The Micro User has a large photograph of an Issue 3 board.

Issue 4 boards are considerably different around the top left hand corner - the Econet region of the board.

You've got a problem with your micro and you just can't sort it out on your own? Then write to MIKE COOK. If he can't help then probably no one can . .



Size only 8 × 15 × 25 cm approx.

The latest in dual $5\frac{1}{4}$ " Disc Drive

We only supply dual drives since they offer best value and flexibility for the serious/professional user.

Model TRK1 80 track S/S 800K £275

Model TRK2 80 track D/S 1600K **£349**

- ★ 800K or 1600K formatted capacity in double density mode
- ★ Fast 3ms track to track access
- ★ 250K Bit/s data transfer rate
- ★ Low power 4W standby, 11.5W running enables use on BBC B power supply
- ★ FM/MFM (single/double density)

- * All British made
- * Full documentation and personal back up service
- * All connectors supplied
- ★ Formatting and utilities disc for BBC B. (includes 40/80 track software switch)
- * Compatible with most computers

Note for BBC users:

Useable disc memory depends on DFS used e.g. Acorn DFS 200/400K; Watford DFS 400/800K; Microware DDFS and Kenda DMFS 800/1600K.

Optional Extras:

40/80 Track Hardware Switch £15.00 Power Supply Unit £36.00

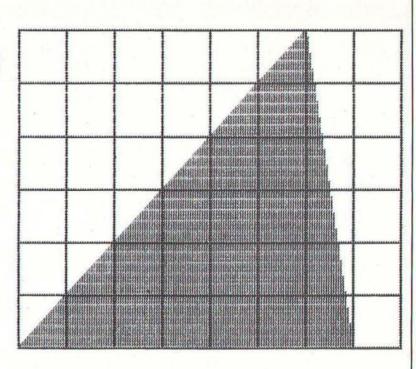
PLtd. 19 Rodney Road, Cheltenham, UK Tel: 0242 570999

Electronics Specialists



Please add VAT @ 15% and £8.00 carriage/insurance to cost of order. Official government and educational orders accepted.

Shape up to maths



AFTER being rather critical of most mathematical software I have seen, the Editor threw down the gauntlet: "Let's see if you can do better".

So here is my first sample, a program to help children from eight to 14 years old to learn about area.

The user is asked for the length of the base, followed by the height and area of assorted rectangles, parallelograms and triangles. Each input is terminated by pressing Return.

The program makes use of the BBC Micro's ability to draw shapes quickly and clearly on the screen and attempts

By JOHN LORD

to trap errors as they occur.

The Escape key is not disabled but is used to return the program to the menu.

The Break key is programmed to re-run the program, so making it difficult for children to get out of the program and play havoc with it.

Some idea of the robust nature of the program was provided by the mother of one of my pupils, who after using it announced: "I'm fed up with this computer. It won't let me make mistakes without printing sarcastic messages!"

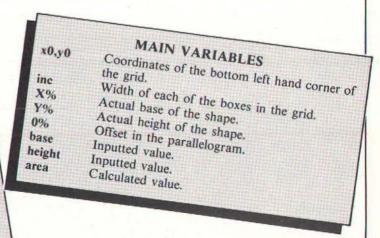
Sometimes I think these messages really make the program for some of my pupils. But learning and enjoying yourself can't be all bad, can it?

Input validation is performed with the ubiquitous REPEAT . . . UNTIL correct loop.

The data entered is compared with the correct value. If incorrect then PROChelp is called and a suitable response is printed.

MAIN PROCEDURES Prints the menu and deals with the Draws and fills either a rectangle or a PROCoptions parallelogram. If the offset, 0%, is zero, selection. then the shape drawn is a rectangle. PROCparallel Draws and fills a triangle. PROCdrawgrid Superimposes the grid on the shape. Handles the printing of the prompts and **PROCtriangle** the positioning of the cursor on the PROCtext Handles the entry of incorrect responses to data requests. It prints a message and screen. clears the incorrect response before PROChelp() allowing the next attempt to enter the

data.



Full listing starts on Page 161

BBC MICRO IN MANCHESTER

PRICES...

All our prices are constantly moving, sc please ring us to che k the latest price.

FREE DELIVERY TODAY (Orders over £90)

If you are in Greater Manchester, Cheshire, Lancashire, Merseyside, West Yorkshire or South Yorkshire, if you ring us now we can send one of our highly trained staff to install your computer equipment Today

WEWILL INSTALL

TEAC 55SRS2



£157.95 inc VAT

The latest 55 series from TEAC is now available from us. These disk drives are the new LSI low power consumption high performance version of the famous 55 series.

100K version (40 tk, 200K with LDOS) at £157.95 inc VAT - 55A2 400K version (40/80 tk, 800K with at £227.95 inc VAT - 55F2 LDOS) 100K Chinon (40 tk, 200K with LDOS) At £135.00 inc VAT

Z80 PROCESSOR

£389 inc VAT

Torch computers bring you the power of CP/M software on the BBC Micro. The Z80 runs at 4MZ and 64K RAM with 4K ROM. The Z80 card fits internally and requires a double-sided 80 track disk drive plus a BBC Micro with disk interface.

Also available is a full range of Business and Programming language software.

- includes FREE Perfect Software Database, Word Processing + Spreadsheet.

STAR 10X



£199 + VAT

The Star 10X is a Centronics, 9×7 Dot Matrix head. It prints at 120 cps, is bidirectional and logic seeking. Buffer is ·8K expandable to 8K. Prints 17 to 5 characters per inch. Prints 136 to 40 columns. Ten character sets including down-loadable and italics. Printer screen dumps up to 240×144 points. Epson compatible. Colour screen dumps available.
Incredible value for money!

SPECIAL OFFERS

£629 : BBC'B', DFS + 100K Disk Drive inc VAT

LDOS £219 100K Disk Drive inc VAT

£299 800K Disk Drive inc VAT

These include immediate installation, all cables and accessories.



COMPUTERS 184 Market Street, Hyde, Cheshire SK14 1EX 061-366 7794 061-366 8223

BBC MICRO HARDWARE (inc VAT)

BBC Model B £399

BBC Model A £299

BBC Model A + 32K £339

Disk Interface £89 Disk Interface with double capacity option £89

Speech Synthesiser £59

ELECTRON (should now be available) £199

MEMOREX DISKS

Double Sided - Double Density

£1.50 inc VAT Box of Ten £14.50 inc VAT

MONITORS



COLOUR Microvitec £219 + VAT Sanyo Normal £209 + VAT Fidelity TV/Monitor £199 + VAT GREEN Sanyo Normal £79 + VAT

Sanyo Hi-Res £109 + VAT Philips Hi-Res £79 inc VAT

PERIPHERALS

MODEMS

OEL200 £73 + VAT

Prestel Terminal

£17.39 + VAT

Teletext

£195.65 + VAT

6502 Processor

£195.65 + VAT

Jovsticks

£14.95 inc VAT

PRINTERS



DAISYWHEELS

Silver Reed EXP500 £299 + VAT

Brother HR15

£399 + VAT Brother Sheet Feeder £199 + VAT

DOT MATRIX

Star 10X Epson FX80 £199 + VAT £399 + VAT

AS USUAL LOADS OF SOFTWARE AVAILABLE Tel: 061-366 8223



THIS month's competition is one for the budding writers among you. All we want you to do is to explain, as simply as possible, one of the Basic keywords such as PRINT or INPUT.

The keywords are all described in chapter 33 of the User Guide. However what we want is something geared more to the beginner.

We're looking for a clear, easy-toread description of the keyword that will give the novice a general outline of its workings. To this end, we'd also like you to supply an illustrative program.

You can choose any keyword, but you've only got 500 words to describe it in — and we'd like you to restrict your program to 10 single-statement lines!

The reward for all this effort is Acorn's 6502 second processor – the accessory that will really supercharge your BBC Micro.

The 6502 second processor is the most powerful expansion of the BBC

Micro to date. Once attached to your micro via the Tube it gives:

- A 3MHz 6502 chip which runs programs up to one and a half times faster than the BBC Micro.
- Up to 44k of RAM available for your Basic programs.
- A massive 60k of RAM that can be used for assembly language programming.
- Full use of all screen graphics modes without the usual loss of available memory.
- A system that outperforms all other home and personal computers on the market.

All in all, it's a prize well worth making that extra effort for. And even if you don't win, your efforts won't be entirely wasted. If your description is good enough we'll publish it in *Micro User*, paying at our standard rates.

Who knows, it could be the start of a new career for you!

£300 software for Adrian

WINNER of our March competition was Adrian Holmes of Bromsgrove. His task was to sort eight ROMs into order of usefulness for the typical BBC Micro owner, and to describe the piece of software he'd like to see on ROM.

The winning order was B, H, E, C, G, D, A, F and the software he suggested was a program to increase characters to any size to make life easier for the visually handicapped.

Adrian's prize is £300 worth of ROM-based software from Watford Electronics, plus the ROM board to put them on.

Send your entry, not later than June 30, 1984, to: Second Processor Contest, The Micro User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Sponsored by
The Micro User
and Electron User

Come and Buy!

Everything on display at the show will be for sale – often at special low show prices.

So you'll easily be able to save much more than your admission ticket in your first five minutes at the show!

On sale at the show . . .

BBC Micros Electrons

Teletext adapters Torch disc packs

BBC Buggies

Second Processors ROM Expansion Boards

Grafpads

Books Joysticks

Interfaces

Disc drives

Data recorders

Lightpens

Modems

Speech Synthesisers Carrying Cases

Cables

Digitizers

VDU stands

Graphics tablets

ROM chips

Monitors

Printers

PLUS many thousands of software programs – games, educational and business packages.

There's much more to summer we go to a new us much more room to

Alexandra Palace, London N22. Thursda

- SEE the latest software hundreds of new games, educational and business programs.
- ★ SEE all the latest add-ons never before have so many exciting new peripherals been launched.
- ★ SEE all the latest techniques and get free advice from our team of experts, writers and programmers.
- Make a note in your diary NOW!



You must see for yourself all the rapid developments in the ever-expanding world of the Electron and BBC Micro!

show. So this 10me - to give show it all.

Sunday, July 19 to 22





Reduced prices for School/College Groups

Entry only £1 per student if bookings are made in advance. Send your cheque (made payable to Database Publications) and SAE to:

Electron & BBC Micro User Show 68 Chester Road, Hazel Grove Stockport SK7 5NY Tel: 061-456 8383

Valid for a minimum of 10 people

SAVE MONEY with our Special Travel and Hotel Offer

Visitors to the Show can obtain cut-price rail tickets from ANY station in the United Kingdom - plus special reduced prices at London hotels.

For full details write to:

Travel Offer, P.O. Box 1, St. Albans AL1 4ED with SAE or Telephone: St. Albans 34475 quoting: The Electron & BBC Micro User Show.

This voucher is worth £1 per head



By handing in this voucher at the door you save £1 off the normal admission price of £3 (adults) and £2 (children).

(Valid for a maximum of 4 people)

10am - 6pm, Thursday, 19July

10am - 6pm, Friday, 20 July

10am - 6pm, Saturday, 21 July

10am - 4pm, Sunday, 22 July

Alexandra Palace Wood Green, London N22.

Number attending: 1 2 3 4







COLOURJET

7 COLOUR INK JET PRINTER

Logic seeking in dot address mode

£499 + VAT

With Centronics parallel interface and free BBC Micro dump listing.

Prints overhead transparencies

Options available:

- Buffered RS232 interface.
- Viewdata & RS232 interface.
- Apple II interface.
- IBM PC dump.

from BBC Micro screen - ½ size mode

Specifications:

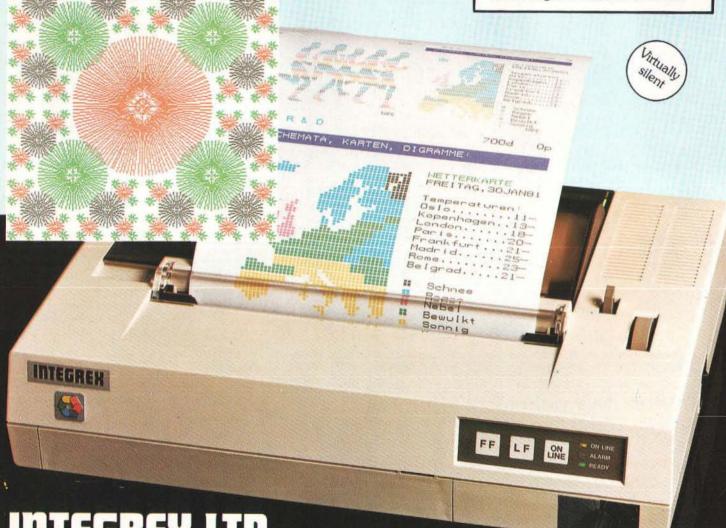
640 dots/line + 1280 dots/line high res mode.

84 dots/inch both axes.

Friction feed rollpaper with single sheet feed A4.

37cps in full colour.

Ink cartridges, 4 million character life.



INTEGREX LTD.
Church Gresley, Burton-on-Trent, Staffs DE11 9PT

Telex: 377106

Tel: 0283 215432

Dealers, OEM & Educational enquiries welcome

Home & Business Computers

THE NORTH'S LEADING COMPUTER SUPPLIERS



HARDWARE

BBCA	£299.00]	inc free
BBCB		Cassette
ELECTRON	£199.00	lead.
BBC A with 32k an		£345.00
(runs all 'B' softw		
BBC Cassette Play	er	£29.95



Daisy Step WP Printer	£345 inc cable
Shinwa CP 80	£239 inc cable
Epson RX 80 F/T	£309 inc cable
$9\frac{1}{2}$ " × 11" Fanfold paper	£12.95



DISC DRIVES

with Acorn or LVL Double Density Interface

51/4"	
100K SS 40 track	£235.95
200K SS 80 track	
400K DS 80 track	
5 ¹ / ₄ " with own power supply	
100K SS 40 track	£269.95
200K Dual SS 40 track	£409.95
400K Dual SS 40/80 track	£545.95
800K Dual DS 40/80 track	£634.95
OPUS 3" (can be mixed with 51/4	")
200K DS 40 track	

400K Dual DS 40 track £389.95

SMALL BUSINESS SYSTEM

COMPLETE WORD PROCESSING AND ACCOUNTING SYSTEM

BBC Model B LVL /D/D Disc Interface 100K 40 track Disc Drive Shinwa Cosmos Printer Word Processing Package Cables, Format Disc, Manuals.

£895.00

+VAT

PLUS Any three of Acornsoft: Purchasing, Stock Control, Accounts Payable or Receivable, Invoicing, Order Processing.

ACCESSORIES

00
00
15
00
95
0
00
50
00
50
95
95
95

MONITORS

Microvitec 14"	£215.00
Decca colour 14"	£206.00
JVC 14"	£199.00
Saba TV/Monitor	£239.95
Philips 12" Green (with sound)	£79.00
Sanyo 12" Green	. £84.95
Phoenix 12" Amber	£99.95
Monitor cable	£3.00

VHS or Beta video cassettes by Master Class

Tape 1 - Starting to Learn Basic Tape 3 - Introduction to the Electron

Tape 2 - Further Basic

Tape 4 - BBC and the Primary Teacher

£19.95

Hire available -

returnable deposit £15 - £3 per week, 50p p&p each (Tapes for Spectrum available)

EDUCATION AND **BUSINESS USERS**

We offer:

- Wide range of Business and Educational Software.
- Educational and bulk order discounts.
- Warranty and post warranty maintenance.
- On site maintenance if required.
- Collection and delivery of repairs if required.

Contact Frank Ratcliffe on 061-633 1608

All prices include VAT

Mail/Telephone orders to Oldham address

Carriage £4.25 per machine **UK** mainland

£1,000 instant credit available



Access



Barclaycard

54 Yorkshire Street Oldham Tel: 061-633 1608

73 Yorkshire Street Rochdale Tel: (Rochdale) 344654

59 Daisy Hill Dewsbury Tel: 0924 455300 THE BBC Micro's disc controller, the 8271, is a mysterious chip. Its impenetrability is heightened by the difficulty of getting hold of the specifications. They are only available in an Intel chip handbook costing about \$18\$.

Here MILES GOOBY sheds light on the subject. And we present a Toolkit of 8271 routines you can incorporate in your own code.

IN the March issue of *The Micro User* an excellent article by Mike Cook gave a nuts and bolts description of the floppy disc, explaining about sectors and tracks, giving the format of a sector, and also an account of what the 8271 chip does.

As Mike says, it stands between the DFS and the disc drive. It allows the DFS to issue a command and then go and do something else while the 8271 tells the drive in great detail the sequence of actions needed to perform the DFS's request.

To give an idea of the actions underlying something as apparently simple as loading a program, let's assume that the first sector of the program is number &98 on the disc and that the program is &4BA9 bytes long (the DFS command *INFO will tell you this).

This information is kept in the catalog so the two catalog sectors must be read first. This requires the following command to be sent to the 8271:

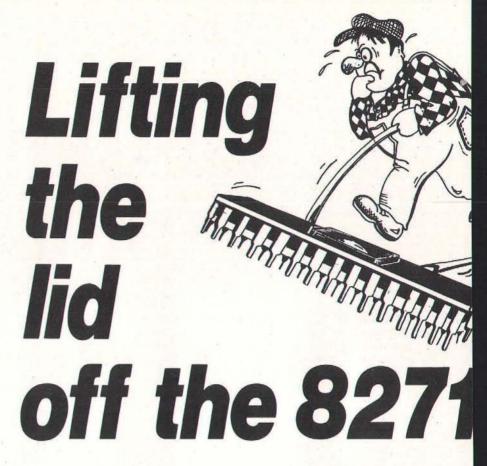
Read 2 sectors from track 0 starting from sector 0

The disc drive itself cannot deal with such a high level command and the FDC (floppy disc controller, the 8271) must therefore break it down into the following sequence of commands which the drive can handle:

- 1: Find out which track the head is on.
- 2: Set the stepping direction to outwards (towards track 0).
- Step the calculated number of tracks.
- 4: Lower the head.
- 5: Read the next sector ID coming under the head.
- 6: Check the track number.
- 7: If it is not track 0 give an error.
- 8: If it is track 0, check the sector number.
- 9: If the sector number is not 0, go back to 5.
- 10: If it is sector 0, read in the data.11: Go back to 5 to get sector 1.

As you can see, the disc controller is really a special purpose microprocessor. Since the data bits come from the drive at 125,000 per second it has to move pretty fast too.

Having read the catalog information,



the DFS knows where the first sector is and the length of the file. As &98 is 152 in decimal, this means the starting sector – at 10 to each track – is on track 15 and is number 2 (the third, starting from 0).

The length of the file is &4C sectors, 76 decimal. So &4BA9 takes &4B sectors plus &A9 bytes of the &4C'th sector. The remaining &57 is unused.

This means the file is contained in sectors 2 to 9 of track 15, sectors 0 to 9 of each of tracks 16 to 21 and finally sectors 0 to 7 of track 22.

Now the disc controller can read more than one sector when commanded, but can read them only from the same track. It cannot move to the next track and continue from there, so the DFS must send the following commands to it:

- GOTO track 15 and read 8 sectors starting from sector 2.
- GOTO track 16 and read 10 sectors starting with sector 0.
- GOTO track 17, and so on.
- ... similarly for tracks 18 to 21 ...
- GOTO track 22 and read 8 sectors starting with sector 0.

This example shows some of the 8271 commands in action. It has in fact got 15 commands with variants. The major ones are illustrated in the assembler program given (Listing I).

It is possible to issue the commands by writing and reading the FDC's registers, but this is harder than using the direct chip access command in th DFS.

One can be forgiven for not knowin there is one as the official Acorn dismanual has only a passing reference quite remarkable in its obscurity – to thuse of OSWORD with A=&7F.

This is the key, and the Watford and Pace disc manuals are much more forthcoming. The Watford manual gives the commands to verify, format and read the sector headers, too.

The call through the DFS needs the drive number and a buffer address followed by the FDC command and parameters. It uses the drive and buffe itself and passes the command and it parameters on to the 8271 with all the correct bowings and scrapings.

So to use the disc controller chip directly the call is, in Basic:

A%=&7F

XX=fcb MOD 256

YX=fcb DIV 256

CALL osword

where fcb is declared as:

DIM fcb 12

and the bytes of fcb are set up by the following code:

fcb?0=drive fcb!1=buffer fcb?5=no_of_params fcb?6=command fcb?7=param1 fcb?8=param2

... &c. ...



Byte 0 of fcb is set to the drive number, bytes 1 to 4 are set to the address from which the data is to be written or into which it is to be read, byte 5 contains the number of parameters the 8271 command requires, byte 6 is the 8271 command + &40-I don't know why) and bytes 7 mward contain the parameters.

The 8271 sets its result register to a completion code which acts as an error code if the command cannot be completed satisfactorily. The DFS returns this code in the byte following he last parameter.

With the Toolkit routines (Listing I), you are spared the necessity of writing and modifying the above code as it has all been put into assembler with a simple nterface to Basic through the resident nteger variables.

The code as written is for Basic II. Listing II shows the lines to be altered to convert it to Basic I. (Note that these are changes to Listing I. Listing II is not a program in its own right.)

If you have this month's Micro User ape then you should load FDCBas as normal and then enter:

*exec FDCBasI

This will make the necessary alterations to the code to make it suitable for Basic I.

Full listing starts on Page 143

THE Toolkit routines have been tacked on to the end of an example program written in Basic which shows how they may be used (Listing I).

They are preceded by a jump table so that the address used to call a particular routine will remain unchanged should the code be moved about by adding or removing instructions or even by adding further commands.

Following the jump table is the OSWORD parameter block and declarations for the 8271 commands. The parameters for each routine are passed from the Basic program through some of the resident integer variables.

Before calling any of the routines, the parameters for the drive and the address for the buffer must be set up. This is done by setting B% to the buffer address and D% to the drive number and calling the routine *initfcb* through the address *init*.

If, later on, you want to change the drive, only D% needs to be changed.

To use the READ routine, the track and sector within the track and the number of sectors to be read need to be specified. The track in T%, the sector in S% and the number of sectors in N%.

Note that the 8271 cannot change tracks while reading, so only 10 sectors can be read when S% is 0, 9 when it is 1 and so on. Make sure there is enough room in the buffer for the data read – 10 sectors is 2,560 bytes.

The WRITE routine takes the same parameters in the same variables as the READ routine, only the bytes are taken from memory and put onto the disc.

With both the READ and WRITE routines, multisector operations are much quicker than a succession of single sector ones, as the 8271 doesn't have to come back to the DFS and the DFS come back to the program in between each sector.

As Mike Cook's article in the March Micro User explained, before a disc can be used, each of its tracks must be formatted. That means the 10 sectors – sector headers followed by a data field – must be written on to each track so the FDC can find where it is. Figure III of his article is a diagram of the sector layout.

The FORMAT routine needs only the number of the track (in T%). It then sets up the sector headers for the track in the buffer. It needs 40 bytes for this – four bytes for each sector comprising track number, head number, sector number and sector length.

These are then passed to the FDC which makes them up into proper headers and writes them to the track with the following data field being set to

THE TOOLKIT ROUTINES

all e (&E5).

The sector addressing data is used by the FDC to make sure it is on the right track (!), find the sector it has been asked to READ/WRITE, and from the sector length, tell how many bytes it has to transfer.

The sector can be any length in the series 128, 256...16384 bytes, though even with one big sector per track you will find it hard to get more than 2,048 bytes on it.

The READ ID routine will read N% sector headers from track T% into the buffer. The first header will be the one immediately after the index hole.

If you read the tracks on a disc formatted by the Acorn formatter FORM40, you will find that the first sector after the index hole on track 0 is number 7 and on track 1 it is number 8.

This is to make it more likely that the wanted sector on the next track will be close to the head when the head moves from one track to the next.

The MKCAT routine is intended for use after the whole disc (or at least track 0) has been formatted. It writes an empty catalog (Acorn style) in sectors 0 and 1.

An empty catalog is all zeros except for bytes 6 and 7 of sector 1 which contain the number of sectors on the disc – &190 for a 40 track, &320 for an 80 track disc.

The seek operation only requires the track (in T%). Note that all that happens is the 8271 sends (T%-current track) pulses to the drive's stepper motor.

If by any chance the motor misses a step, the 8271 has no way of knowing and it must read the information put on the track while formatting the disc to be sure it is in the right place.

If an error occurs during any of these operations, a message is printed instead of just an error number.

The Basic program provided is intended to illustrate the use of the routines – it should not be used as a Disc Doctor.

For one thing, the formatting will assume that a whole disc is to be formatted if the first question — "Enter no, of tracks" — is answered by 40 or 80 and will assume that only a few specified tracks are to be reformatted otherwise.

You can't format 40 consecutive tracks on an 80-track disc with the program as written.

BBC SPECH

PRICE BREAKTHROUGH

Speech Synthesizer For The BBC Computer

Totally unlimited vocabulary is now possible with the revolutionary "SWEET TALKER" Speech Synthesizer for the B.B.C. A or B Microcomputer, any series.

The CHEETAH "SWEET TALKER" simply plugs into speech socket IC99 within the computer.

No soldering, no cutting of tracks, no headaches.

Based on an allophone system you can easily program any word, sentence or phrase and incorporate speech into your software games.

Fully tested and guaranteed.

Complete with demonstration cassette and full instructions.

Price includes V.A.T., Postage and Packing. Delivery normally 14 days.

Export orders at no extra cost. Dealer enquiries welcome.

Send cheque/PO now to:-

Incredible at

HEETAH MARKETING L

Dept. MU1, 24 Ray Street, London EC1, Tel: 01-833 4909

Cheetah, products available from



branches of John Menzies 3000 WHSMITH and Rumbelows



SPECIAL OM SER OFFER FROUSER THE MICRO USER

The

Advanced User Guide

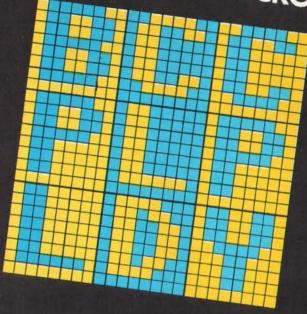
The essential companion for the BBC Micro.

Featured in its 512 information packed pages are

- * the BASIC Assembler
- ★ 6502 machine code reference section
- ★ complete descriptions of all FX calls
- ★ BBC memory usage and vectors explained
- ★ full interfacing details for the user port, tube, analogue port, 1 MHz bus
- ★ paged ROMs explained
- ★ and lots, lots more

With many examples to illustrate the text, this guide is the indispensable reference work for the serious BBC micro programmer.

THE ADVANCED USER GUIDE FOR THE BBC MICRO



BRAY, DICKENS & HOLMES

£12.95

ORDER BY POST TODAY!

Please send me copies of The Advanced User Guide at £12.95 (inc. p&p) TOTAL £

Signed

Send to: Micro User, FREEPOST, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY. (No stamp needed if posted in UK). Please indicate method of payment (✓)

- Cheque/PO made payable to Database Publications Ltd.
- □ Access/Mastercharge/Eurocard
- □ Barclaycard/Visa
- □ American Express

Card No.

Expiry date

Or you can order by phone quoting credit card number and expiry date.

061-480 0171



A 100k BBC-drive for £99 + VAT

We've done it! We've built a storage system for your BBC Micro with the power and convenience of a floppy disk drive, at a fraction of the price. Interface to the BBC costs £26 + VAT and runs up to 8 drives.

PHLOOPY's special secret

PHLOOPY does not record on a disk, but on a loop of quarter-inch tape contained in a rugged interchangeable cartridge.

The heart of PHLOOPY is a unique "byte-wide" magnetic head, that gives it its speed by recording nine tracks across the tape. Typically, you can access a file in only 3 or 4 seconds.

If you're used to waiting for a cassette tape to trundle programs into your BBC, you'll be amazed at PHLOOPY's performance—up to 100 times faster.

Talking to your PHLOOPY

PHLOOPY's own software makes it respond to standard BBC filing system and Basic commands.

Programs written to run on disk or cassette should run on PHLOOPY without problem.

And because your PHLOOPY drive contains its own

microprocessor – a second computer which does most of the hard work – it puts very little load on the BBC. The on-board computer also checks and automatically corrects any read errors.

Your PHLOOPY Library

PHLOOPY cartridges
hold a full 100k of data. You
can buy blank cartridges for
£3.75 each plus VAT. Many BBC
programs will be available on PHLOOPY.

Phi Mag Systems Ltd. PO Box 21, Falmouth, Cornwall TR11 3TD Tel: (0326) 76040

Order Forn				
ease send me fu	rther details abo	ut the PHLO	OOPY	100k dat
ige system for t	he BBC Model I	3.		
		CONT		ALL PROPERTY.

Please send me_____(qty) PHLOOPY starter pack(s) for my BBC
Model B microcomputer, including PHLOOPY drive, BBC
interface, leads, connections, operating system in firmware, manual, and two PHLOOPY 100k cartridges, at £147.75 each including VAT, postage and packing.

Amount £______

Please send me (qty) packs of 5 PHLOOPY cartridges at £19.75 including VAT, postage and packing.

Amount £
Amo

I enclose a cheque/PO for COR Please debit my
Access card Number:

Your order will be acknowledged within 10 days, giving a delivery date.

Name

Address

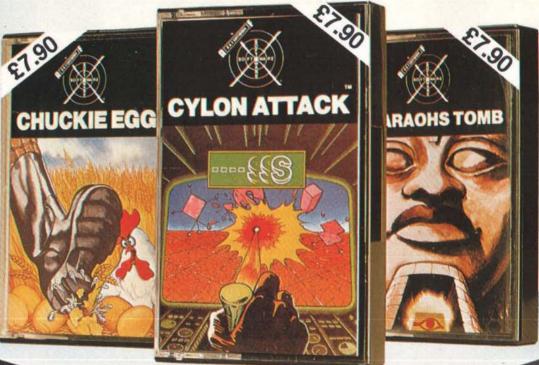
Send this coupon to: Phi Mag Systems Ltd, PO Box 21, Falmouth, Cornwall TR11 3TD. Telephone: Falmouth (0326) 76040.

14 day money-back option.

BBC

"ATTENTION EARTHLINGS..





BBC ELECTRON DRAGON SPECTRUM

CHUCKIE
EGG
CYLON
ATTACK
JUNGLE
FEVER
PHARAOHS
TOMB

Available from W.H. Smiths,
John Menzies and all leading
computer stores.

Unit 8, Canalside Industrial Estate, Woodbine Street East, Rochdale, Lancs. OL16 5LB. Tel: 0706 341111 Armdroid

Colne Robotics

ROBOTICS is an area of computer control which is becoming increasingly popular, both with educational establishments and home enthusiasts.

Now that the cost of the controlling computer has reached affordable levels, the major stumbling block for those interested in this area has been the mechanical side.

Very few people with the mechanical skills to build a robot have the electronic and computing skills to control it and vice versa. Therefore there is a need in the market for a low cost mechanical robot device.

This has been filled by various manufacturers by the use of mobile boxes, turtles, buggies and so forth.

Interesting though this approach is, I have found them to be very disappointing in practice.

The need for a large, flat uncarpeted area, and the problem of them getting tangled up with their umbilical leads, limits their uses, even for educational purposes.

However, Colne Robotics has produced a BBC version of its computer-controlled robot arm, called Armdroid. It is driven by six stepping motors and is constructed of robust sheet steel.

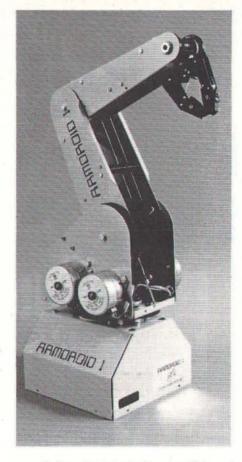
The motor movement is transmitted to the various sections of the arm by a Heath Robinson-like collection of plastic gears, ribbed rubber belts, pulleys and twine. Despite this, it operates quite effectively.

At the end of the arm there are three fingers that can close and grip an object.

The arm is available either readybuilt or in kit form. The most difficult part of assembling the kit is stringing up the pulleys.

Construction of the arm would make an excellent group project but is quite a time-consuming task that should not be undertaken lightly. The ready-built version is well worth the extra money.

The documentation, although a bit tatty, shows exploded mechanical drawings of all parts of the arm. So if



you do buy it ready-built you will know how to take it apart.

The stepping motors take a fair bit of current and so a separate power supply is provided.

The one I received for review had unfortunately upset the Post Office and they had subjected it to a high inertial shock. The upshot was that it rattled and the whole thing could be turned on and off by shaking it.

The power supply is fitted with "tamper proof" screws and so I did not tamper with it. There is also a conventional on/off switch if you are not lucky enough to have it modified by the Post Office.

The task of controlling six stepping motors simultaneously is not simple and so a very good demonstration program is provided. This allows you to drive each motor by pressing keys on the keyboard.

Once you have driven the arm to a

particular point you can get the computer to remember it.

Having entered several points like this the computer can be made to move the arm through all the points in sequence.

Alternatively, you can step forwards or backwards through each point on command from the keyboard.

A point to note is that the arm will move directly from one point to the next in a straight line. Therefore you must set several points to move the arm over an object.

This is where the single stepping comes in – to allow you to intervene if you have programmed the arm to scythe through anything.

The torque of a stepping motor decreases as its speed increases. So if the arm is to lift anything heavy it needs to be slowed down.

However, while the arm is getting into position it is a bind to go so slowly. To this end the software allows you to select a different speed at each preset point.

Also, you can set a delay at each point so that the arm pauses before moving on to the next position.

The power required by the motors also varies depending upon the position of the arm.

I found the motors had to be slowed down slightly when the arm was at full stretch, even when it was carrying nothing.

The demonstration program is menu driven and fairly self explanatory. It can even display the arm's position in "absolute coordinates" which correspond to the number of steps the motor has received.

You can get a version of the arm with micro switches that detect the limit of travel on all six motors. This can prevent the arm being driven past its mechanical limits of movement.

The version I had did not have these on and although this might sound like a disadvantage it made very little difference in practice.

This was because I was always

Arm yourself with a robot – and have fun

Quinkey

Microwriter

MICROWRITER, a small portable word processor with about 8k of memory, has been around for several years now. What made it unique, apart from portability, was its rather special keyboard which only has six keys.

The Microwriter keyboard itself – without the inbuilt memory – is now available for the BBC Micro as the Quinkey.

Strangely, the name suggests it has five keys (from the Latin *quinque*=five) though the name might have been more interesting if it had derived from the Latin for six (sex)!

Quinkey is housed in a good quality plastic moulding, about 9 x 4.5 x 2in in size. The six full travel keys have a positive though light feel and are arranged in a semi-circle so that the fingers of the right hand will rest above them. The thumb has two keys to control, while the other fingers control one key each.

Connection to the BBC is by a cable to the analogue port – where joysticks plug in. Up to four keyboards can be connected at the same time.

Before the micro can recognise the new keyboard a short piece of software (PROG) needs to be loaded and run. After this nearly every character and command can be entered directly from the Quinkey keyboard.

This linking software can be added to your own Basic programs. The manual contains notes on how this can be done easily.

To begin with I was rather sceptical. I had seen a demonstration before but it's difficult to believe that a keyboard with only six keys could replace the standard



Six-year-olds soon felt quite at home on the Quinkey

Microwriter keyboard is handy on the Beeb

qwerty typewriter keyboard.

I doubted even more the claim that it would be easy to learn.

Well, after only a short time I had changed my mind. An hour or so is all it takes to learn all the alphanumeric and main control characters.

The manual supplied is clear. Simple diagrams show the keys to be selected and mnemonics are given to aid your memory. However putting in information quickly will obviously take more experience.

Interestingly the characters are selected, not when the keys are pressed, but when they are released. People find it easier to release keys together rather than pressing keys at the same time.

Also, because your fingers stay in the same position, you feel that you don't need to keep looking at the keyboard, which encourages touch typing.

Microwriter has also written some programs which make use of the keyboard such as Learn, which starts to give the basic ideas using the "shape a letter" system.

One of the best of these programs is Skram, a "zap" game. Here letters displayed on the screen must be selected within a time limit and more quickly than other players.

The keys pressed are displayed along with the correct combination if the answer is incorrect.

The graphics and sound combine to make this an entertaining way of learning to use the keyboard.

The Quinkey can be used as an alternative to the standard keyboard in word processing packages such as Wordwise and View. For example, this review was written with Wordwise via a Quinkey.

To allow for the numerous control codes in these programs a slightly different linking program called WP is supplied.

One drawback was that all the software was on tape. It would have been easier if it had been on disc. The best solution would be for the linking software to be in ROM, ready for use when required.

This is one piece of equipment that I'll be sorry to give back.

Jim Notman

From Page 117

watching the arm, and the extra strain caused the motor to stall, thus causing no damage at all.

I found using the arm both fascinating and fun. One of the first things I did was to program it to pick up a handkerchief, swivel round and drop it in my lap. Then placing my son (two years old) at the computer, the arm dutifully delivered it into his lap.

This caused great delight and he tried to give it back to the arm. Ever since he has periodically come up to it with one offering or another.

The use of this arm in a teaching situation would be very worth while, not only to teach about robotics, but also project planning.

The nature of robotics dictates a carefully planned approach. This makes the arm very suitable for group projects.

As well as fixed sequences it would be possible to program some "intelligence" into its operation.

When the result of writing a computer program is the controlling of objects it is very much more satisfying than words appearing on a screen.

This robot arm should be a great source of inspiration for the experimenter as well as being a valuable teaching aid.

Besides which it is great fun.

Mike Cook

Aries B20 RAM card
Cambridge Computer Consultants

ONE of the shortcomings of the BBC Micro has been its lack of user memory, although its total memory is no smaller than any other micro (including those advertised by elephants).

Acorn has decided to use the memory in the BBC Micro to give you a more powerful working environment which allows your programs to be shorter.

However in the higher resolution graphics modes you can easily run short, especially if you have large amounts of data to handle as well.

The principle of adding extra memory by the process of paging is not new – it has been used on the Apple computer for many years. It is even incorporated into the BBC Micro in those unique sideways ROM sockets.

Nevertheless, the trouble with a paged RAM system is that the software has to be aware that it is there.

The Aries RAM board gets round this limitation brilliantly and gives an extra 20k of RAM. It does this by switching a piece of sideways RAM that lies over the same address as the RAM used for the display.

This is normally switched in, so the extra board is used to store our program. However whenever a VDU command is executed the board automatically switches out and accesses the display memory.

The practical result is that you can use any graphics mode and still have the same amount of memory. This means you have an extra 1k if you are using Mode 7 or an extra 20k if you are using Modes 0 to 3.

Therefore when you are writing programs you don't have to compromise on complexity in order to use a high resolution mode.

The fact that this switching is done totally automatically makes it transparent to any software you use. So it will work with any software "correctly written". By that I mean software that uses the correct operating system calls.

However some programs, usually games, access the memory directly to allow fast animation. These will not work while the Aries board is operational so it can be turned off from the keyboard.

The commands *XOFF and *XON allow it to be switched. As the board takes up a few extra bytes of memory when you turn it off it will prompt you to press the break key to recover these bytes.

Aries RAM card gives you room to stretch

In fact I found that the Break key had to be pressed to complete the turning off process. Therefore you can't load a program, turn off the board and then recover the program with the OLD command.

This was a minor irritation, as I found I remembered I needed to switch the board off just after I had loaded the program in.

The hardware consists of a plug-in board and a sideways ROM. You remove the microprocessor chip and plug it into the board. The board then plugs into the empty microprocessor socket.

The whole board is supported by fine-turned pillars that plug into the vacated socket and are of such a design that they can be easily removed without doing any damage to it.

The whole thing resembles a North Sea oil platform. Add the ROM to any socket and you are ready to switch on.

When you do you will be greeted by the message "BBC Computer 52K." This tells you the board is in operation. A *HELP will also inform you of its presence.

The board is not mechanically compatible with the APTL sideways ROM board as both span the same part of the board.

Cambridge Computer Consultants is planning to bring out its own sideways ROM board for those who need that function.

The switching between the two planes of RAM inevitably takes some time, so I set out to find out how much the operation of the board slowed down a graphics program.

To do this I modified the Pattern program on the Welcome tape to always produce the same pattern and then I ran it with and without the board in operation.

The program appeared to be just as fast, so I made the internal clock time them. Without the board it took 13.16

seconds and with the board it took 13.33 seconds. Therefore it took 0.17 seconds extra – just under 1.3 per cent longer.

This program has a higher than average number of screen accesses and being just 0.17 seconds longer in over 13 seconds does not worry me. In fact I can't think of a situation where it would be a problem.

If you want to use Mode 7, for example, you then have 19k of memory doing nothing. This can be used for storing data by use of the indirection operators.

The two planes of memory can be switched using a *FX call. The instruction manual explains how to do this and I can confirm that it works.

The great thing about this system is that the software does not have to know it is there. Therefore you can have an 80 column display when using VIEW and still have the full amount of memory.

However I found that Wordwise would not work with the board switched on. This must be because it directly accesses the memory instead of using the VDU calls.

The only other incompatibility was in programs that used a *SAVE to store a screen display on disc. These must be modified to swap the memory just before and after the SAVE, or they can be run with the board off.

Who would benefit from this board? Just about anybody who has ever come across the "No room" or "Bad mode" error messages.

If you are a programmer the extra space gives you room to stretch. If you are using a compatible word processor you can see the text as it will be printed and still have the maximum amount of memory to store your text.

At the price the Aries board is well worth it and is something that has become a permanent feature on my machine.

Mike Cook

rcreenpray ///.

£200 COMPETITION

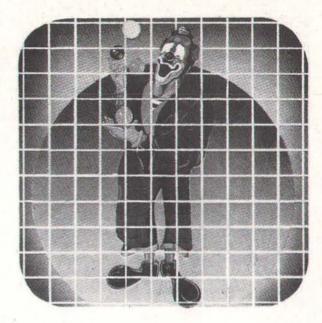
SCREENPLAY offers anyone who buys the ANIMATOR for the DRAGON 32/64 or the BBC Micro, the chance to recover the cost and a whole lot more.

All you have to do is to write an original program using the SPRITES from the ANIMATOR. Programs may be written in basic or machine code.

The winning program will be published by SCREENPLAY and the author will receive £200 cash plus royalty payments, subject to SCREENPLAY standard terms and conditions, a copy of which can be obtained by request.

Even if you don't win the £200 cash prize, if your program is of high enough standard, you could be making MONEY before the closing date of the 1st September 1984, by having your program published by SCREENPLAY.

Rules of the competition and entry forms are included in the package. All entries will be acknowledged.



THE ANIMATOR is a sprite GENERATION package for the BBC MICRO and THE DRAGON 32/64. The sprites produced have collision checking facilities built in and can be moved around the screen from your own basic or machine code programs.

The programs are supplied in a box with a comprehensive manual and demo programs. Details of each product are given below.

SPRITE FEATURES INCLUDE:

BBC MICRO:

Maximum size sprite 30×30 pixels:

16 colours in each sprite:

64 sprites at 8×8 pixels or 9 sprites at 30×30 pixels:

Each sprite generates 2 other related clones.

ONLY £11.95

DRAGON 32/64:

Sprite size up to 40×40 pixels:

all available colours:

all 5 HI-RES modes:

25 sprites at any one time:

40 page manual and demo game

included.

ONLY £9.95

DEALERS

CONTACT 041-248 2481 for details of our range of software and dealer terms.

PROGRAMMERS:

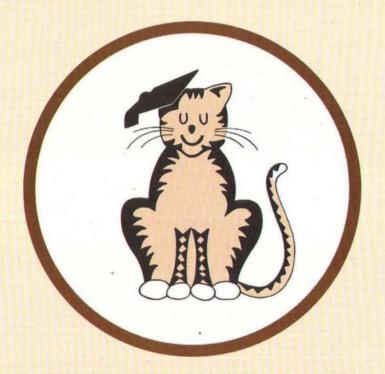
Excellent royalties paid for top quality original programs. Send off now to, the PROGRAMMING DEPARTMENT at SCREENPLAY.

SCREENPLA	coupon and send it now to: Y, 134 St. Vincent Street,
My name is	
Address	

All cheques payable to SCREENPLAY.

Best news yet for BBC Micro users Now Available

CHESHIRE CAT **EDUCATIONAL SERIES** from AMPALSOFT



CHESHIRE CAT

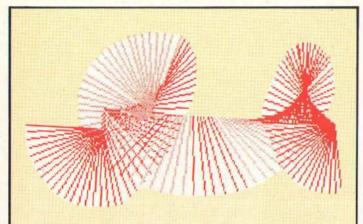
The First name in Educational Software.

An exciting range of top quality programs covering all needs from pre-school to 'A' level.

> Ampal Computer Services Ltd. 31 Woodbridge Road, Darby Green, Blackwater, Camberley, Surrey. Tel: (0252) 876677

W.H. SMITHS, RUMBELOWS AVAILABLE FROM AND OTHER GOOD STORES.





Try freewheeling with SPOKES

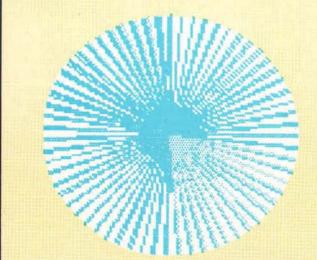
SPOKES is a program which draws a multicoloured pattern like the spokes of a wheel.

And you aren't stuck with just the one pattern. You can use the keyboard to move it around the screen. It's a fascinating and beautiful demonstration of the Beeb's graphics abilities.

KEYS:

- Z Move centre left
- X Move centre right: Move centre up
- / Move centre down
- Increase spoke length
- Decrease spoke length
- 10 REM --- SPOKES ---20 REM IAN ARCHER
- 30 REM (C) THE MICRO USER
- 40 MODE 1
- :VDU 23,1,0;0;0;0;
- 50 F=0
- : X%=640 : Y%=512
 - :R%=200
- 60 VDU 19,3,6;0;
- 70 PROCKEY 80 VDII 29.17:17:
- 80 VDU 29, XX; YX; 90 MOVE 0.0
- :DRAW RX*COS F,RX*SIN F
- 100 F=F+.1

- 110 IF RND(10)=16COL 0,RND(3)
- 120 GOTO 70
- 130 :
- 140 DEF PROCKEY 150 K%=INKEY (0)
- 160 IF KZ=58YZ=YZ+4
- 190 IL KY=384Y=47+4
- 170 IF KX=47YX=YX-4
- 180 IF K%=88X%=X%+4
- 190 IF KZ=90XZ=XZ-4
- 200 IF K%=59R%=R%+4
- 210 IF K%=46R%=R%-4
- : IF R% (OR% = 0
- 220 IF K%=32CLS
- 230 IF KX=-1ENDPROC
- 240 GOTO 150





CUMANA PRICE LIST

Cumana BBC Microcomputer compatible disk drives: retail prices

Cumana disk drives supplied with formatting diskette, drive connecting cable and comprehensive user manual. Independent power supply, mains lead and moulded plug included.

CS100 Single 40 Track single sided	£169
CS200 Single 80 Track single sided	£209
CS400 Single 80 Track double sided	£233
CD200 Dual 40 Track single sided	£305
CD400 Dual 80 Track single sided	£386
CD800 Dual 80 Track double sided	£431
CD400/S Dual 80/40 Switchable single sided	£469

Cumana disk drives with independent power supply, mains lead and plug. Excluding other accessories.

CD800/S Dual 80/40 Switchable double sided

CS100E Single 40 Track single sided
CS200E Single 80 Track single sided
CS400E Single 80 Track double sided
£153
£195

Cumana disk drives supplied with formatting diskette, drive connecting cable and comprehensive user manual. Power supply taken from BBC Microcomputer, with lead supplied.

CSX100 Single 40 Track single sided
CSX200 Single 80 Track single sided
CSX400 Single 80 Track double sided
£149
£193
£215

- ★ Top quality 5¼ inch TEC and Mitsubishi Japanese disk drives
- ★ Fully assembled and tested before packaging
- ★ 12 months warranty
- ★ Attractive hardwearing cabinets in BBC beige

Available from the following retail outlets:

W. H. Smith, John Lewis Partnership, Greens Leisure, Laskys, Spectrum UK Area distributors:

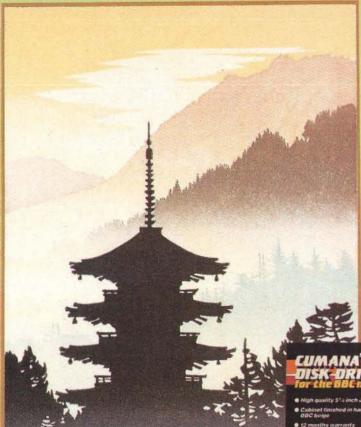
HCCS Associates (Gateshead) 0632-821924, Eltec (Bradford) 0274-722512, Basic Business Systems (Nottingham) 0602-819713, Walters Computer Systems (Stourbridge) 03843-70811, Microage Distribution (North London) 01-205 7688, J. S. Simnett Computers (South London) 01-390 6161, Ferranti & Craig (Basingstoke) 0256-69966, Gwent Computers (Wales) 0633-859582, National Micro Centre (Stockport) 061-456 9548, Microworld (Edinburgh) 031-228 1111, Microtest (Cornwall) 0208-3171.



+ National Dealer Network
Please note: all prices exclude VAI
and delivery charges

£499

...THE BEST NAME IN MEMORY



Print from Japan

Disk Drives from Cumana

Like the beautiful prints from Japan, Cumana disk drives represent the very highest standards in design and production. Also like the prints, Cumana disk drives represent the highest state of the art; and they not only look beautiful, they perform beautifully as well.

Cumana disk drives for the BBC Microcomputer are available in slimline single, dual and dual switchable versions. They have 12 months warranty, are fully assembled and tested before packaging, and are available — at unbeatable value for money prices — from W. H. Smith, The John Lewis Partnership, Greens Leisure, Laskys, Spectrum UK, area distributors (see below) and Cumana's national dealer network.

Look out for the distinctive Cumana packaging in your high street, today!

Area distributors:

HCCS Associates (Gateshead) 0632-821924, Eltec (Bradford) 0274-722512, Basic Business Systems (Nottingham) 0602-819713, Walters Computer Systems (Stourbridge) 03843-70811, Microage Distribution (North London) 01-205 7688. (Stourbridge) (J843-70811, Microage Distribution (North London) 01-205-7686 J. S. Simnett Computers (South London) 01-390-6161, Ferranti & Craig (Basingstoke) 0256-69966, Gwent Computers (Wales) 0633-859582, National Micro Centre (Stockport) 061-456-9548, Microworld (Edinburgh) 031-228-1111, Microtest (Cornwall) 0208-3171, DRG Business Machines (Weston-Super-Mare) 0934-415398, Kingdom Design (Belfast) 0232-643720, Hugh Symonds (Bournemouth) 0202-26535, Audio & Computer Centre (Jersey) 0534-74000.

The Highest State of the Art

For further information about Cumana disk drives for the BBC	Name	
Micro, please complete and return this coupon.	Address	
Interests:	Address	
Home Use		
Dealer Business	Tel. No.	



Cumana Limited. Pines Trading Estate, Broad Street, Guildford, Surrey, GU3 3BH. Telephone: Guildford (0483) 503121. Telex: 859380.



The Graduate.

The first IBM P.C. compatible upgrade for the BBC model B micro.

Technical Specification
8088 16-bit processor running at 5 Mhz
128K RAM (Expandable to 256K)

MS™-DOS operating system customised to IBM compatibility
Model G400 Single BASF disc drive (320K formatted)
Model G800 Double BASF disc drives (640K formatted)
Integral stabilised power supply
2 IBM P.C. compatible hardware expansion buses
Colour Software provided (not G400)
Perfect Writer/Speller (Word Processing)
Perfect Calc (Spread-Sheet)
Perfect Filer (Database)
Disc interface is not required

See The Graduate on stand 405 at the Computer Fair, Earls Court, June 14–17

For further information contact Data Technologies Ltd.
Century House, Market Street, Swavesey, Cambridge CB4 5QG Tel (0954) 30817

ANDREW GOLDSWORTHY finds a subliminal solution to teaching spelling

THE problem was brought home to me
— literally — by my young daughters.
Every week they are given lists of words
by their school teachers and told to
learn to spell them. They then demand
that I test them repeatedly until they are
word perfect.

This seemed an obvious job for the computer, which has more patience than the average mortal. Unfortunately the problem of teaching spelling seemed pretty intractable.

In order to test someone on spelling, you must tell him (or her) what to spell without telling him how, and since most small computers communicate mainly in writing, this presents an obvious

problem.

Various solutions have been tried, such as using graphics to draw a picture or to use a voice synthesiser. In either case writing the program for each new word is so time consuming as to be simply not worthwhile.

The program I have written is a new and simple way to solve this problem.

It is based on subliminal or near-subliminal prompting and, as far as I know the idea is original.

The words to be learned are drawn in sequence from the user's own list of data and flashed on the screen for long enough for the child to recognise them, but not for so long that he can take in their spelling.

He is then asked to type in the word. If his spelling corresponds to that in the data he is allowed to proceed to the

The program is slightly more complicated in that it is designed to cope with several children of differing spelling abilities. When they type in their name, the computer selects the appropriate list.

A similar system could be used in schools to teach a whole class of children. But if the numbers are large it might be more convenient to type in their "spelling grade", say A, B or C, instead.

The score of correct and incorrect answers is given at the end of the sequence. Or it can be obtained at any time by typing in S in place of the word.

Line 10 disables the keyboard auto-repeat. Inexperienced young "typists" find this facility a bit disconcerting when they are trying to concentrate on their spelling.

Also unwanted characters in the keyboard buffer can cause problems with a program controlled by GET\$.

Lines 20 to 140 give the instructions

SPELL WELL -IN A



and ask for the user's name (or grade).

Lines 150, 160 and 170 operate in conjunction with the data lines so that one of three spelling lists may be selected according to the child's name.

If an unrecognised name is typed in, the system defaults to the first list.

The user can type in his own lists of data on lines 400 to 409, 410 to 419 and 420 onwards respectively.

The words should be separated by commas, but no spaces. The last item should be the letter Z to indicate the end of the sequence.

When the child's name has been entered there is a short delay (lines 210 and 220), after which the word in A\$ is flashed on to the screen.

The duration of the flash is determined by the length of the FOR NEXT loop on *line 250*.

The value 500 was selected by trial and error using my own children as guinea pigs, but this could be varied to cope with children of different abilities.

If he missed it the first time, the flash can be repeated by hitting Return (line 290) without affecting the score.

Line 310 compares the child's input with the authentic word. If they match the computer prints "correct" and the child is rewarded by a short musical sequence.

For use in a classroom it might be best to delete the three SOUND statements on this line. If the answer is incorrect *line 320* allows the same word to be repeated until a correct answer is obtained.

Lines 330 to 390 are concerned with displaying the score and returning the child to the earlier parts of the program so that he can repeat, or continue, with the sequence he was doing, or change the sequence.

1 REM A SPELLING TEST 2 REM 3 REM by ANDREW GOLDSWORTHY 4 REM 5 REM For use in schools or 6 REM at home to help children 7 REM learn to spell with the 8 REM user's own word-lists. 9 REM (c) Micro User 1984 10 *FX11.0 20 CLS 30 PRINT "I will make a word" 40 PRINT "Flash upon the screen" 50 PRINT "Then I'll ask you spell it" 60 PRINT "As soon as it's been seen" 70 PRINT :PRINT 80 PRINT "(hit 'return' for another look)"

Spell listing

From Page 125

90 PRINT "('S' and 'return' gives the score) *

:PRINT

:PRINT

:PRINT

:PRINT

100 RESTORE 400

110 PRINT

:PRINT

120 PRINT *TYPE IN YOUR NAME OR GRADE AND HIT"

130 PRINT "'RETURN'"

140 PRINT

: INPUT TAB(8) NAME\$

150 IF NAME\$="A" OR NAME\$="ALICE" THEN RESTORE 400

160 IF NAME\$="B" OR NAME\$="CATHERINE

THEN RESTORE 410

170 IF NAME\$="C" OR NAME\$="MARY" OR NAMES = "= MATTHEW" THEN RESTORE 420

180 C=0

: W=0

190 READ AS

200 T=TIME

210 IF TIME (T+180 THEN GOTO 210

220 IF A\$="Z" THEN GOTO 330

230 CLS

240 PRINT TAB(15,10) A\$

250 FOR X=1 TO 500

:NEXT X

260 CLS

270 PRINT TAB(5,18) "SPELL THE WORD AND PRESS RETURN*

280 PRINT

: INPUT TAB(15)B\$

290 IF B\$=""

THEN CLS

: GOTO 200

300 IF B\$="S"

THEN GOTO 330

310 IF B\$=A\$

THEN PRINT TAB(17) "CORRECT"

: C=C+1

:SOUND 1,-15,50,10

:SOUND 1,-15,66,10

:SOUND 1,-15,78,10

:60TO 190

320 PRINT TAB(17) "TRY AGAIN"

: W=W+1

:60TO 200

330 CLS

:PRINT TAB(8,10) "SCORE CORRECT=

":C

:PRINT TAB(8,12) "SCORE INCORRECT

= ":W

340 PRINT TAB(8,16) "HIT 'R' TO REPEA T OR CONTINUE"

350 PRINT TAB(8,18) "HIT 'C' TO CHANG E GRADE"

360 6\$=6ET\$

370 IF G\$="R"

THEN GOTO 150

380 IF 6\$="C"

THEN GOTO 100

390 GOTO 360

400 DATA BOBBING, ACTIVITIES, ELIZABET H, MATTHEW, CONCERT, MUDDLE, FIREWOR KS, TIPPING, Z

410 DATA CAT, FILL, DOG, Z

420 DATA FISH, FIND, TWO, Z

This listing is included in this month's cassette tape offer. See order form on Page 165.

*

THE MULTI-FUNCTION ROM BASED UTILITY COMPLETELY COMPATIBLE WITH ACORN DFS AND ALL ACORN DFS SOFTWARE. FEATURING-



BACK UP ALL YOUR SOFTWARE

A simple method to produce a back up of all your valuable software. No need to format the receiving disc. Simply type MIRROR and watch your exact copy being produced (including protected discs).



DISC FORMATTER - DOES NOT DESTROY CURRENT MEMORY

Format a disc directly without need to save your work and load a utilities disc.



60 FILES PER DISC

Create a new catalogue to allow the user up to 60 files. First 30 files are completely compatible with non 'Upgrade' systems.



FULL SECTOR EDITOR

Read and display any disc sector in hex and ascii with the option to amend any byte as necessary.



APPEND FUNCTION

Speedily join useful routines and programs to form a new working



VERIFY FUNCTIONS

Checks all contents of disc are readable and reports bad sectors. Also an option to verify that the program just saved corresponds to your current memory contents.



DISC STATUS FUNCTION

Check files and free space on a disc without destroying current memory contents.



RUN CASSETTE BASED SOFTWARE

Simplifies the running of cassette based software on disc. Both basic and machine code.





I enclose cheque/PO* for £ Charge my Access/Visa £+

Card No.

Signature Name. Address

*payable to Aiiigata Software Ltd. 178 West Street, Sheffield S1 4ET + allow 75p for post and packing



SEND SAE FOR FULL DETAILED SPECIFICATION.

178 West Street, Sheffield S1 4ET. Tel: (0742) 755796

BBC Model B (any OS, Basic I/II)

QUAL-SOFT

£9.95 (inc. VAT and p.p.)

RFV1*

ANNOUNCES THE

"LEAGUE DIVISION ONE"

£100

£100

 $\mathbf{\mathfrak{L}}100$

JUNE

JULY

AUGUST

MANAGER OF THE MONTH

COMPETITION

We guess that most of our users are, like ourselves, disappointed that they won't be watching any of the home countries' teams in the European Nations' Cup. So, to take us through the summer, we are running our own "MANAGER OF THE MONTH" competition for June, July and August. That's 3 prizes of £100 each for the best managerial performance to be submitted to us during those months. The rules are very simple. We believe that the recently announced REV.1 of the program is an accurate measure of your ability as a soccer manager. We are looking for the best 5 season performance (one game) to be played in that month. You submit your best game, played at any level, on the official entry form supplied with all copies of "League Division One REV.1". A full description of the rules appear on that form; they merely ensure no "cheating", that you are a genuine owner of the program, and that no-one connected with QUAL-SOFT takes part. You can submit only one entry each month, but can enter in each of the 3 months (except for the winner).

Current owners of the game will understand the competition, but for newcomers here is a brief account of the game. The program realistically simulates the problems of the manager of a club newly promoted to the 1st Division of the Football League. You have a squad of 18 players and a further 12 players available on the transfer market. Your job is to build up a squad which, over the next 5 seasons, will challenge for the 1st Division Championship. The game will test your knowledge of the real game of soccer to the full, and your ability to use that knowledge intelligently. This doesn't mean that you have to be a genius to play well, our best performance to date (that we know of) has been from a 13 year old, but you do need to think hard about your tactics and strategy.

For a more detailed description look back over the last 6 issues of The Micro User.

A WORD ON MAIL ORDER. Many people are, justifiably, concerned about mail order. Delivery can be bad, even non-existent; no-one to contact in the case of problems, letters go unanswered; worst of all the programs are often amateurish or just plain "junk". Right? Doubtless you have other complaints.

DELIVERY: We ship on the day of receipt of order! SUPPORT:

CONTACT: Call the Tel. No. below and DEMAND to speak to Malcolm Howard if you have any problems! BACKUP/DISC: We not only allow backup we ADVISE you backup your tape immediately. Transfer to disc is straight forward. We recommend Mike Bibby's advice, page 133 May issue of The Micro User. REPLACEMENT: Tapes deteriorate with time, and are sometimes accidentally damaged. We will replace such tapes at a VOLUNTARY cost of 50 pence. On upgrades, see bottom left of our coupon. PROGRAM QUALITY: LD1 uses 28.5k of memory despite using the efficient Mode 7, with a 20 page manual/booklet and a 12 page REV1 supplement. It is written by a professional ANALYST/programmer which allows Mr. A. Ashton of Luton to write, ".... I think the boffins involved deserve a pat on the back, not only for an excellent program but for their understanding of the game and its problems.

* Current Owners. As promised, return your original cassette and re-recording of LD1 REV1 and the new REV1 supplement. (Keep your present 20 page LD1 booklet.)

QUAL-SOFT

Dept. CES

Herts. Tel: (0438) 721936 £9.95.

Please supply a copy of LEAGUE DIVISION ONE. I enclose cheque, postal order, ACCESS card authorisation for

CARD NO:

NEW

800K from a single disc drive
When you upgrade to

Available ex-stock ex-stock discs with

QFS



complete disc interface and DFS

- Supports single and DOUBLE DENSITY
- Automatic density recognition
- Acorn compatible (beware non-compatible DFS)
- Supports single and double-sided discs
- Supports 40 or 80 tracks
- Up to 256 files per disc
- Firmware Format and Verify
- Complete with manual
- Simple to fit yourself everything you need is supplied (including instructions!) No soldering – just plug in

£95

New Slimmer of the Year only 28mm in height



Double sided 40 Tk (400K) £199 complete with PSU and cable for BBC

BBC Model B £347 QFS £95 40Tk double-sided drive £199 Package 1
BBC Model B
fitted with QFS
complete with
40Tk double sided
drive
£640
carriage FREE

Package 2
BBC Model B
fitted with QFS
£442
carriage FREE

Package 3
QFS plus
40Tk double sided
drive
£294
carriage FREE

All prices exclusive of VAT and Carriage

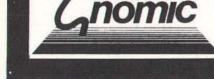
GENERAL NORTHERN MICROCOMPUTERS LTD.

Dept. BU684, 2 Whitworth Road, South West Industrial Estate, Peterlee, Co. Durham, SR8 2JJ.

Telephone: Peterlee (0783) 860314 (24 hour Answering Service)

Credit Facilities Available



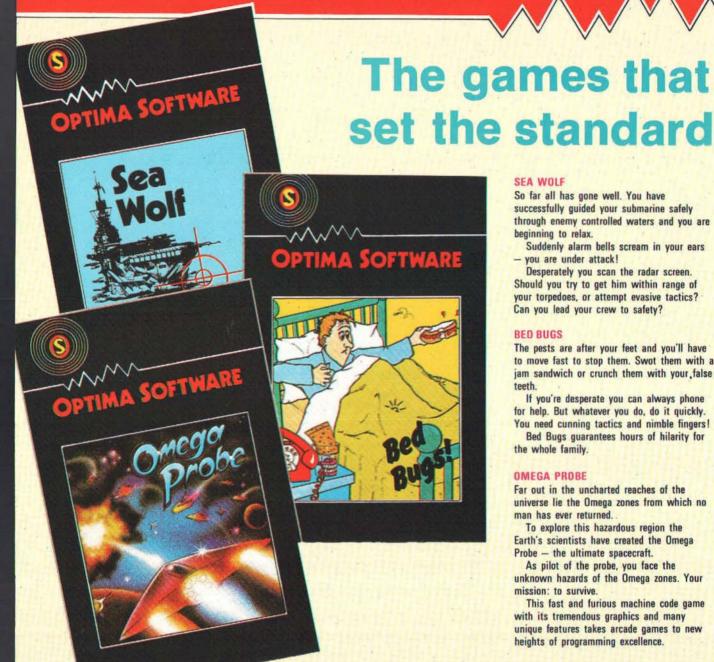


Dealer

Enquiries Welcome

OPTIMA SOFTWARE





So far all has gone well. You have successfully guided your submarine safely through enemy controlled waters and you are beginning to relax.

Suddenly alarm bells scream in your ears - you are under attack!

Desperately you scan the radar screen. Should you try to get him within range of your torpedoes, or attempt evasive tactics? Can you lead your crew to safety?

SEA WOLF

The pests are after your feet and you'll have to move fast to stop them. Swot them with a jam sandwich or crunch them with your, false

If you're desperate you can always phone for help. But whatever you do, do it quickly. You need cunning tactics and nimble fingers!

Bed Bugs guarantees hours of hilarity for the whole family.

OMEGA PROBE

Far out in the uncharted reaches of the universe lie the Omega zones from which no man has ever returned.

To explore this hazardous region the Earth's scientists have created the Omega Probe - the ultimate spacecraft.

As pilot of the probe, you face the unknown hazards of the Omega zones. Your mission: to survive.

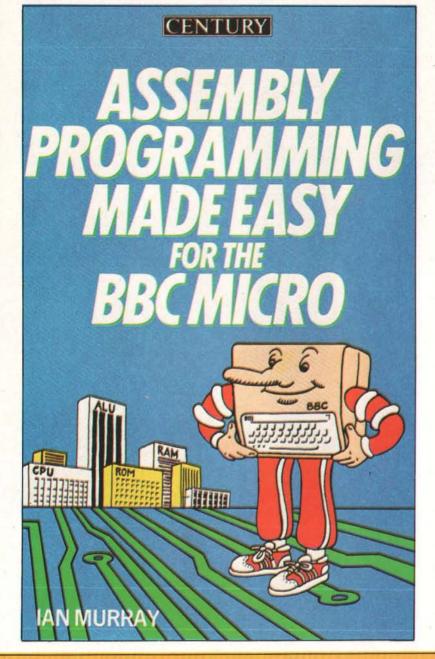
This fast and furious machine code game with its tremendous graphics and many unique features takes arcade games to new heights of programming excellence.

Get these great games from your Acorn dealer or send off the coupon below to: Optima Software Ltd, 36 St. Petersgate, Stockport SK1 1HL.

Sea Wolf BBC 'B' cassette £6.95 Electron cassette £6.95 BBC 40 track disc £8.95 BBC 80 track disc £8.95	Bed Bugs BBC 'B' cassette £6.95 Electron cassette £6.95 BBC 40 track disc £8.95 BBC 80 track disc £8.95	Omega Probe BBC 'B' cassette £6.95 Electron cassette £6.95 BBC 40 track disc £8.95 BBC 80 track disc £8.95		I enclose acheque payable to Optima Software Ltd. I wish to pay by *Access/Visa (*delete as appropriate).
Name			Card No. Expiry date	TV (TELETETE E E E E E E E
			Signed	

HOWABLE!

The magic world of machine code is at your finger-tips...



ASSEMBLY PROGRAMMING MADE EASY FOR THE BBC MICRO

IAN MURRAY

Here is a really easy guide for the enthusiastic beginner to assembly language for the BBC Micro. Using easy examples, cartoons and short, very simple programs you will quickly learn how to put graphics on the screen, use the BBC operating system and bring the machine to life. £5.95

To make learning assembly language even easier send for the combined book and tape cassette containing all the programs.

			F		

To: Database Publications
Europa House,
68 Chester Road, Hazel Grove
Stockport SK7 5NY.

BOOK ONLY

Please send me _____ copy/copies of ASSEMBLY PROGRAMMING FOR THE BBC MICRO by IAN MURRAY at £6.95 per copy incl. p&p

BOOK AND CASSETTE Please send me _____ copy/copies of ASSEMBLY PROGRAMMING FOR THE BBC MICRO by IAN MURRAY plus cassette(s) at £12.95 per pack

(please make cheques/postal orders payable to Database Publications Ltd.)

Name____

Address_____

1 **2 4 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6**

Please allow 28 days for delivery.

Road Racer listing

:PLOT 85,1080,0

From Page 83	:DRAW 670,500 :PLOT 85,200,0	770 PROCscore 780 IF TI>58AND scene%=1
:ENDPROC	:MOVE 610,500	THEN VDU 19,10,1;0;
390 DEF PROCsetupi	:DRAW 670,500	ELSE IF TI>58AND scene%=2
400 GD=1	:PLOT 85,640,0	THEN VDU 19,10,2101
1T1=0	:VDU 29,640;512;	ELSE IF TI>58AND scene%=3
:score1Z=0	:ENDPROC	THEN VDU 19,0,0;0;
:score%=0	540 ENDPROC	ELSE IF TI>58AND scene%=4
:del%=120	550 DEF PROCtele_pole	THEN VDU 19,10,7;0;
110 VDU 19,0,4;0;19,1,2;0;19,2	560 FOR P=1TO 3	:VDU 19,0,4;0;
,2;0;19,3,0;0;19,4,0;0;19,5	:GCOL O,P	790 IF TI>59AND scene%=1
,2;0;19,8,2;0;19,9,1;0;19,10	570 IF P=1	THEN VDU 19,8,1;0;
,2;0;	THEN X=89	ELSE IF TI>59AND scene%=2
:CB=13	:Y=11	THEN VDU 19,8,2;0;
20 CO1%=0	ELSE IF P=2	ELSE IF TI>59AND sceneX=4
:C02%=2	THEN X=B1	THEN VDU 19,8,7;0;
:MCPX=-80	: Y=9	BOO UNTIL TI>60
30 CH1%=0	ELSE IF P=3	B10 IF scene%=1
1CM2X=0	THEN X=73	THEN CO1X=1
:CM3%=0	:Y=7.5	*C02%=1
40 MC1%=2	580 PROCdrawi	:VDU 19,5,1;0;
:MC2%=2	590 NEXT	ELSE IF scene%=2
:MC3X=2	600 ENDPROC	THEN CO1%=0
50 ENDPROC	610 DEF PROCdraw1	:C02X=2
60 DEF PROCroad	620 FOR I=1TO 11	:VDU 19,5,2;0;
70 VDU 29,0;0;	630 VDU 29,640;512;	ELSE IF scene%=4
180 GCOL 0,10	:MOVE 0,0	THEN CO1Z=0
:MDVE 200,550	:HOVE -X,-Y	:C02X=7
:DRAW 640,550	DRAW -X,-Y-Y	:VDU 19,5,7;0;
:PLOT 85,800,520	:MOVE -X+(Y/5),-Y-(Y/8)	820 del%=del%-5
90 GCDL 0,8	:DRAW -X-(Y/5),-Y-(Y/8)	:IF del%<=100
:MOVE 0,550	:MOVE X,-Y-Y	THEN del%=100
:DRAW 350,600	:DRAW X,-Y	830 score%=score%+TI
:PLOT 85,610,500	#MOVE X+(Y/5),-Y-(Y/8)	840 TI=0
:MOVE 1280,550	:DRAW X-(Y/5),-Y-(Y/8)	850 ENDPROC
:DRAW 670,500	640 X=X+1.37	860 DEF PROCeovecar
:PLOT 85,990,620	:Y=Y+1.7	870 SOUND 1,1,5,4
00 6CDL 0,5	:NEXT	B80 VDU 5
:MDVE 0,0	650 ENDPROC	:6COL 0,0
:DRAW 200,0	660 DEF PROCMOVE	: MOVE HCP%,-412
:PLOT 85,0,553	670 REPEAT	:PRINT PC\$
:PLOT 85,610,500	*FOR IX=3TO 1STEP -1	890 IF MCPX<=-250
: MDVE 670,500		THEN MCP%=-300
:DRAW 1280,550	680 JZ=IZ+1 :IF JZ=4	ELSE IF MCPX>=86
:PLOT 85,1080,0		THEN MCPX=120
:PLOT 85,1280,0	THEN JZ=1	900 IF PDINT (MCP2+20, -412)=9
510 GCDL 0,4	690 VDU 19, IZ, CO1Z; 0; 19, JZ, CO2Z; 0;	OR POINT (MCPX+160, -412)=9
	700 BR\$=INKEY\$ (0)	THEN PROCErash
:MOVE 0,553	710 IF 6R\$="M"	910 IF POINT (MCPX+50,-412)=9
:DRAW 610,500	THEN 6Y=1	
:MOVE 670,500	ELSE IF BY=0	OR PDINT (MCPZ+130,-412)=9
:DRAW 1280,550	THEN 700	THEN PROCErash
520 DEF PROCroad1	720 PROCaovecar	920 IF BR\$="."
530 VDU 29,0;0;	730 PROCCar	THEN MCPX=MCPX+100
:6COL 0,0	740 IF GR\$=" "	ELSE IF GR\$=","
*MOVE 200,0	THEN BY=0	THEN MCPX=MCPX-100
:DRAW 610,500	750 PROCdelay	

760 NEXT

Road Racer listing

Fre	om Page 131	1170	:ENDPROC BCOL 0,9		ELSE GOTO 1450 DEF PROCdelay
070	0001 0.4	11/0		1400	
420	GCOL 0,6		: MOVE CX3X (MC3X) , CY3X (MC3X)		:FOR del=1TO del%
	:COLOUR 6		:PRINT CN3\$(MC3Z)		: NEXT
	: HOVE HCP%,-412		:VDU 4	4470	:ENDPROC
	:PRINT PC\$		MC3X=MC3X+1	14/0	DEF PROCscore
	IVDU 4		ENDPROC		:TI=TI+1
	: ENDPROC		DEF PROCcrash		:score1%=TI+score%
940	DEF PROCCAR	1210	SOUND 0,-10,5,10		:VDU 4
950	CHC=RND(6)	1220	count=0		:PRINT TAB(1,1); "SCORE: "; score!
	: IF CHC=10R CM1%=1	1230	FOR count=1TO 40		2*10" "
	THEN PROCear1	1240	count=count+1		:ENDPROC
960	IF CHC=30R CM2%=3	1250	MOVE MCP2+80,-412	1480	DATA 255,255,24,60,126,126
	THEN PROCcar2		A=RND (80)		,129,0,7,3,0,61,61,61,61,61
970	IF CHC=30R CM3%=5		:B=RND(100)+350		,224,192,0,188,188,188,188
	THEN PROCear3	1270	GCOL 0,RND(4)+5		,188,0,0,0,0,60,219,255,195
000	ENDPROC		DRAW AB		,0,7,4,31,17,17,17,31,24,231
	DEF PROCCar1	1200	:MOVE MCPZ+80,-420		,66,66,129,129,255,0
				1400	
	CM1%=1	1000	:DRAW -A,-B	1470	DATA 0,224,32,248,136,136,136
1010	VDU 5		NEXT count		,248,0,0,255,255,24,60,255
	:SCDL 0,0	1300			,0,0,0,0,0,0,224,224,224,0
	#MOVE CX1%(MC1%-1),CY1%(MC1%-1)	1310	IF 60=3		,0,0,0,0,7,7,7
	:PRINT CN1\$(MC1%-1)		THEN PROCend	1500	DATA -35,-50,-70,-100,-200
1020	IF MC1Z=15	1320	60=60+1		,-390,-50,-60,-70,-100,-230
	THEN CM1X=0	1330	PROCroad1		,-350
	:MC1%=2	1340	MCP=-80	1510	DATA -35,-50,-70,-100,-200
	:ENDPROC		:MC1=2		,-390,20,30,35,35,30,110
1030	GCOL 0,9		:MC2=2	1520	DATA -35,-50,-70,-100,-200
	:MOVE CX1X(MC1X),CY1X(MC1X)		:MC3=2		,-390,-10,-10,-10,-25,-70,-80
	:PRINT CN1\$ (MC1%)	1350	ENDPROC	1530	DEF PROCinstruction
	:VDU 4		DEF PROCend	1540	
	MC1X=MC1X+1		VDU 29,0;0;		:COLOUR 2
	ENDPROC	10/0	:CLS		:PRINT TAB(15,1); "ROAD RACER"
	DEF PROCcar2		:VDU 4	1550	PRINT TAB(15,2); ""
	CH2X=3	1700	scoreX=scoreX+TI+10		COLDUR 1
		1300		1500	:PRINT
	VDU 5		:COLOUR 9		
	:BCOL 0,0		:PRINT TAB(4,1); "ROAD RACER"		PRINT
	*MOVE CX2%(MC2%-1),CY2%(MC2%-1)		PRINT TAB(4,2); ""		:PRINT " The object of the
	:PRINT CN2\$(MC2%-1)		COLOUR 4		game is to dodge the cars
	1F MC2X=13	1410	PRINT		for as long as you can. The
	THEN CM2X=0		:PRINT "You scored ";score1%10		scenes change four times."
	:MC2%=2	1411	*FX15,1	1570	PRINT
	: ENDPROC	1420	IF score1%+10>Hi		:PRINT " The directions are
1100	GCDL 0,9		THEN PRINT "ENTER NAME";		as follows:"
	:MOVE CX2X(MC2X),CY2X(MC2X)		: INPUT NAME\$	1580	PRINT
	:PRINT CN2\$(MC2%)		:Hi=score12#10		:PRINT " (LEFT"
	:VDU 4		:HX=Hi	1590	PRINT " >RIGHT"
	MC2%=MC2%+1		PRINT		PRINT " MSTART"
	ENDPROC	1100	:PRINT "HI-SCORE:"		PRINT " SPCSTOP"
	DEF PROCcar3				PRINT TAB(7,20) PRESS A KEY
	CM3X=5		PRINT TABLOT HE P. S. NAMES	1020	
		4440	:PRINT TAB(0);Hi;":";NAME\$		TO PLAY";
	VDU 5		PROCsetup1		:A=GET
	:6COL 0,0	1450	PRINT TAB (3, 13) "ANOTHER GAME";	1630	ENDPROC
	*MOVE CX3% (MC3%-2), CY3% (MC3%-2)		:INPUT A8\$		
	:PRINT CN3*(MC3%-2)		:IF AB\$="Y"		This listing is included to
1160	IF MC3%=19		THEN 35		This listing is included in this month's cassette tape offer. See
	THEN CM3%=0		ELSE IF AG\$="N"		order form on Page 165.
	:MC3%=2		THEN END	A REAL PROPERTY AND ADDRESS.	The state of the s

ARE YOU MAKING BEST USE OF YOUR **USER PORTS**

MHz I / O INTERFACE

Provides 8 Control Outputs and 4 - 6 Signal Inputs for Robotic, Industrial & many other control applications. Available in Kit form or fully assembled & tested.

1MHz 16 Bit VIA

The User Port only provides 8 Bit Control, yet many applications require 16 Bit Data Control. This Adaptor enables projects using 16 Bits to be developed via the 1 MHz Port.

Available in Kit form or fully assembled.

USER PORT SERVO INTERFACE

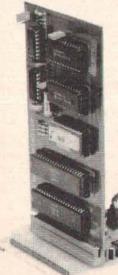
A simple Kit to enable the 8 Bit User Port to operate all types of Servo motors - adapts to any 8 Bit User Port.

USER PORT DECODER

Converts the 8 Bit User Port to provide 8 Addressed Outputs, 4 Data Inputs and a 4 Bit Data Input - many different Add-on units & projects may then be connected to enable one or all projects to be run simultaneously under program control.

ELECTRON I / O INTERFACE

This usefull Interface provides the Electron with a normal BBC-type 8 Bit User Port PLUS capability of 16 Bit Port or Printer Output plus 8 Addressed Outputs, 4 Data Inputs and a 4 Bit Data Input. *Enormous potential for all types of applications.*



NIKAM 6502 MICRO CONTROLLER

A Star product which enables programs developed on the BBC Assembler to be downloaded via the RS423 Port and blown onto EPROM. The Micro Controller will then autostart on power up to perform as a dedicated Stand Alone unit.



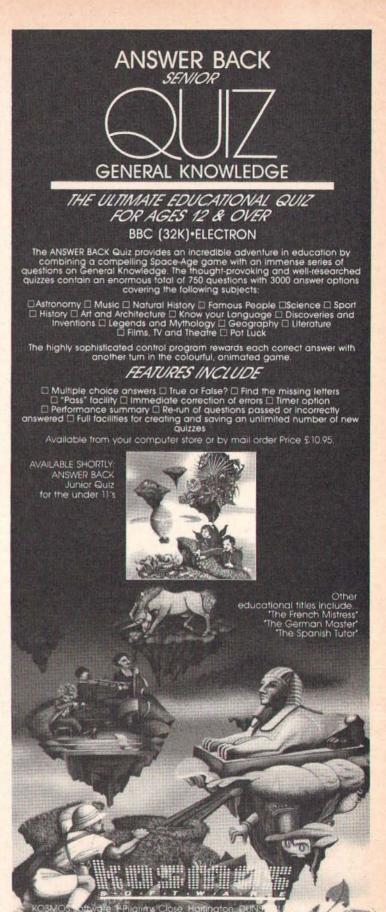
Applications include Robotics, Data Logging, Timing, Machine Control, Speech & Sound Synthesis etc.

Please write for full details & prices to:-



KELAN ENGINEERING LTD.

Circuit Products & Components Division. 27-29 Leadhall Lane Harrogate. North Yorkshire HG2 9NJ. A FARNELL ELECTRONICS COMPANY Tel: (0423) 870938.



The ANSWER BACK Senior Quiz will educate and fascinate ANYONE over 11

KOSMOS SOFTWARE, 1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX
Please send me the ANSWER BACK Senior Quiz for the BBC/ELECTRON computer.
Mr/Mrs/Miss

Address

Post code

I enclose a cheque/postal order for £10.95 payable to KOSMOS Software

LANGUAGE LEARNING AIDS FOR FRENCH, GERMAN & SPANISH

FOR BBC(32K) · ELECTRON SPECTRUM (48K)

As used in numerous schools and colleges these programs provide a highly successful aid to modern language learning. Each cassette contains a sophisticated control program and a comprehensive series of vocabulary lessons which can be used in a variety of self-paced learning and test modes. Words, phrases etc are displayed with all necessary accents and special characters, different colours are used for masculine, feminine and neuter words to assist gender learning.

The programs are suitable for beginners, 0-level and beyond as simple commands enable new lessons in vocabulary or grammar to be created by the user, edited as required, then permanently saved for later use. Invaluable for homework and exam revision!

Two cassettes are available for each language, together these contain a vocabulary of thousands of words; Level A provides 16 lessons in general subjects; Level B provides a further 16 lessons including adjectives, adverbs and fully conjugated verb lists.

Available from your computer store or by mail order Price £9.95 Also Available "ANSWER BACK General Knowledge Quiz" Price £10.95



KOSMOS Software 1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX Telephone (05255) 3942

Please supply the following programs

The French Mistress Level A # \$9.95 |
The German Master Level A # \$9.95 |
The Spanish Tulor Level A # \$9.95 |
ANSWER BACK Quiz (Senior) # \$10.95 | The French Mistress Level B # 59.95 |
The German Master Level B # 59.95 |
The Spanish Tutor Level B # 59.95 |

I have a BBC/Electron/Spectrum computer (delete as necessary)

Mr/Mrs/Miss...

Address ..

. Post code

l enclose a cheque/postal order for £

payable to KOSMOS Software

KOSMOS SOFTWARE 1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX

COMPUTER CENTRE

HARDWARE

ACORN	
Electron	199.00
8-B C	
BBC Model 'B'	399.00
BBC Model 'B' + DFS	489.00
Opus 100K Disk Drive	
PACE DISK DRIVES	100.05
PSD1 (100K single) 40T	169.95
PSD2 (200K single) 40T	239.95
PSD3 (400K single) 40/80T	2/9.95
PSD4 (400K single) 80T	244.95
PSD5 (200K single) 40/80T	254.95
PDD1 (200K double) 40T	334.95
PDD2 (400K double) 40T	469.95
PDD3 (800K double) 40/80T	555.95
PDD4 (800K double) 80T	479.95
PDD5 (400K double) 40/80T	499.95
All drives include formatting disk a	
MONITORS	
Sanyo 12" Green Screen	79 95
Fidelity CM14 Col. Monitor	199.95
Sanyo 14" Col Mon inc. cable	
Microvitec 14" Col Mon	

ACCESSORIES

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
U.D.M. Double Density DFS	89.95
Acorn DFS	89.95
L.Y.L. DFS	89.95
Amcom DFS	
Telemod II Digital Modem	79.95
Software for above (ROM)	22.95
Software for above (Cass)	14.95
Analogue Joysticks	16.95
Switching Joysticks	
Sanyo Slim 3A	
Pye C6600 Data Rec	
R.H. Light Pen	44.95

PRINTERS

SPECIAL OFFER **EPSON FX80**

- 160 C.P.S. FRICTION/TRACTOR FEED ONLY £375.00

INC VAT	0.00
EPSON RX80	269.95
RX80 F/T	294.95 375.00
FX100	549.95
GP100A	199.95 269.95
STAR	

Gemini 10×(80 column) . Gemini 15×(132 column) 389.95 MICRO PERIPHERALS MCP 40 Printer/Plotter 129.95
Printer leads and ribbons available at competitive

SHINWA Shinwa CP80 (80 column)

SOFTWARE BUSINESS

GEMINI	
Database	19.95
Stock Control	19.95
Invoices	19.95
Beebcalc	19.95
Cash Book	59,95
Final Accounts	59.95
Easi Ledger	19.95
Beeb Plot	19.95
Mailist	19.95
Payroll	19.95
Home Accounts	39.95
	if disc

GAMES

AARDVARK

Frak	6.95
ADV INTERNATIONAL	0.33
Adventureland	705
Pirate Adventure	7.95 7.95
Voodoo Castle	7.95
Secret Mission	7.95
	1.50
A+F	
Chuckie Egg	7.95
Cylon Attack	7.95
ALLIGATA	
Bug Blaster	7.95
Lunar Rescue	7.95
Eagle Empire	7.95
BUG BYTE	
BUG BYTE Twin Kingdom Valley	9,50
GEMINI	
Liberator	9.95
Missile Control	9.95
Sleighbells	9.95
MELBOURNE HOUSE	
The Hobbit	4.95
MICRO POWER	1.00
Killer Gorilla	7.95
Helldriver	7.95
Bandits at 3 o'clock	7.95
Cybertron Mission	7.95
Martian Attack	7.95
Zarm	7.95
Nemesis	7.95
Positron	7.95
Intergalactic Trader	7.95
Chess	7.95
Laster Command	7.95
Alien Swirl	7.95
SOFTWARE INVASION	
Gunsmoke	7.95
3D Bomb Alley	7.95
Attack on Alpha Centurai	7.95
Vortex	7.95
DACC.	
747 Simulation	0.00
Super 7	
Sprite Gen	
	7,85
COMPUTER CONCEPTS Wordwise	4.05
Disc Doctor	2.33
Termi 3 Graphics ROM 3	2.30
Gremlin 3	2.30
Communicator 6	4 QE
Communicator	7.33

SANYO

CD3125N

COLOUR MONITOR

- 14 inch screen
- R.G.B.
- Leads for BBC inc.

£199.95

SAVE £40

MAIL ORDER

Please address all telephone and postal enquiries to the Wigan Branch. Mail orders despatched by return post, Postal charges:

Micro's, Monitors + Drives - £6.00

Accessories - £2.00

Software - 50p



All prices include VAT at 15%



PRICES CORRECT AT TIME OF GOING TO PRESS BUT SUBJECT TO CHANGE WITHOUT NOTICE E & O E

WIGAN

11 Mesnes St, Wigan Lancs. WN1 10P Tel: Wigan (0942) 44382 Closed Wed.

PRESTON

49 Fishergate, Preston Lancs, PR1 8BH Tel: Preston (0772) 556250 Closed Thurs.

BOLTON

23 Deansgate, Bolton Gtr. Manchester BL1 1HH Tel: (0204) 33512 Closed Wed.

WARRINGTON

111 Bridge St, Warrington Cheshire WA1 2AR Tel: (0925) 38290 Closed Thurs.

CHORLEY

68 Market St, Chorley Lancs. PR7 2SE Tel: Chorley (02572) 74224 Closed Wed.

STOCKPORT

1 Little Underbank, Stockport Cheshire SK1 1LA Tel: 061-480 3435 Closed Thurs.



PAEAN systems

PROGRAMS FOR BBC MODEL B/ELECTRON*

Quebec Marketing MU, Little Bealings, Woodbridge, Suffolk IP13 6LT. Tel: Ipswich (0473) 623757



Drive yourself mad around this maze adventure. You will have to stay adventure. You will have to stay pretty cool to avoid trouble, cope with a myriad of hazards, not to mention a bolshy mate, and get your deliveries right, all at the same time. The Law is never far behind . . . so watch out!

Full scoreboard. Optional sound. Keyboard.

This program teaches the Morse Code; Character to Morse, Morse to

Character. Random character group sequences and 36 word passages provided at a choice of 8 speeds. Limited facilities to simulate

transmission using the keyboard.

SCAN £7.50 An original card based game of great subtlety. The idea is to place 25 of your 26 cards in positions which equal or are greater than the value of the computer's cards. Excellent graphics include clues about the suits and values of the computer's hidden hand - you must be very shrewd to win the maximum 40 tricks. Keyboard.

TELEWRITER

Mode 7 Text/Graphics Manipulator

UTILITY

TELEWRITER £9 50

A suite of programs comprising Telewriter -Main editor -Displays up to 20 pages of data -Allows inserts to Teleflip Teleload

other programs -Demonstrates 10 pages of data to play with

This is a powerful utility which gives the serious user easy domination over the BBC's extensive Mode 7 capabilities, Comprehensive manual.

SLIDER

Synchronises a film slide projector with a taped commentary

UTILITY

SLIDER £8.50

This utility synchronises a single slide film projector with a pre-recorded tape commentary or music background. A slide projector with remote control is required. Programs allows up to 999 slides to be controlled for variable display times. Applications for lecturers times. Applications for lecturers, photographers, architects etc. and micro film users. Instruction manual.

LIGHT CYCLES

A fast reaction game for the fleet of hand and mind. Can you surround the enemy with your light trace and make them crash? The better you are, the more cunning and numerous the enemy become. Simple and infuriating. Full scoreboard and sound. Keyboard.

MORSE INSTRUCTOR

£5.95

SHIP LIGHTS GUIDE

£5.95

Recognition of ships' lights from three aspects, ahead, abeam, astern. A program designed to assist users in fast identification in conformity with the International Collision Regulations and to test knowledge at a primary or advanced level.

ALL PRICES ARE **FULLY INCLUSIVE**

We always require good programs on general or specialist subjects for the BBC or Electron.

FRUG

This utility allows examination of any area of the BBC's memory or any disc sector. Step. Move, Zero, Transfer, Alter, Read/Write to discs, Printout, Display, etc. A simple and excellent debugging program with full

EUROPE

£5.95

Detailed map of Europe with 9 sections of 25 questions each covering Capitals, Countries, Rivers, Seas, Populations, EEC & Warsaw Pact Countries at 2 levels. Ability to plot and calculate distances between any two points. Suitable for 8-15 year

AVAILABLE AT GOOD COMPUTER STORES, SELECTIVELY FROM MICRONET 800 OR DIRECT FROM PAEAN SYSTEMS



ORGANISATION AT YOUR FINGER TIPS!

£8.50

Hardware and Software for the BBC Micro. Just a few of our Business, Domestic & Educational Programs available on cassette or disc.

107 MEMO-CALC £12.95 + VAT B C/D

"It must be among the least expensive pieces of useful software you will ever buy" Revue by Practical Computing July 1983.

This is a database/calcsheet program which is allows up to 255 columns. The number of rows is automatically set from 5 to over 1000 depending on the columns declared. Both numeric and alphameric data can be stored in any cell and can be of any length

106 PAYROLL (W or M) £24.95 each + VAT B C/D

Two part programs to handle the wages on a weekly or separately on a monthly basis for up to 100 employees in memory at the same time. Order as WEEKLY or MONTHLY. Deduct £5.00 if both weekly & monthly programs purchased at same time. A PAYROLL update service is offered at £6.00 per annum + VAT

304 STATPACK £9.95 + VAT B C/D

A statistic package written by Micro-Aid that first appeared in the Personal Computer World magazine between autumn of 1978 and the Spring of 1979 as a series of articles. This fascinating suite of modules will appeal to Schools, Colleges and businesses alike proving extremely valuable.

102 CASHBOOK £11.95 + VAT B C/D

FIRST CHOICE, This is a double entry cashbook program showing cash and bank credits and debits, i.e. 4 columns. Any number of individual accounts can be used and analysed or totalled individually or cumulatively by associated group.

LANGUAGE & UTILITY ROM'S from many sources from £18 SEND NOW FOR OUR FREE BROCHURE!

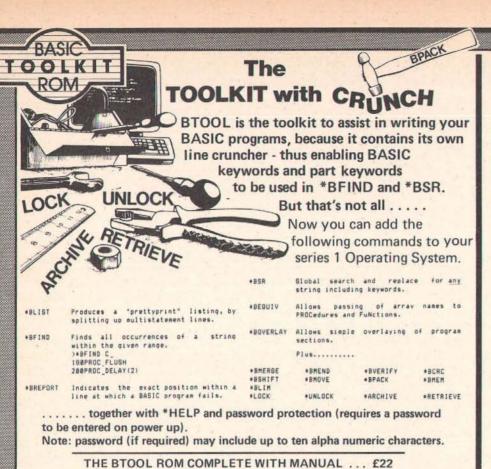
Most of our programs are on PRESTEL (Micronet) 60043703 and can be down loaded directly.



25 Fore Street, Praze, Camborne, Cornwall TR14 0JX UK Tel: (0209) 831274

Quadline listing

From Page 55	:FLAG=FALSE	:NEXT
	890 VDU 5	1190 IF FLAG ENDPROC
580 VDU 31,XX,YX	900 LXX=256	1200 PROCshuffle(4,3)
590 LOCAL a7,b7,c7,d7,X7,Y7,A7	:OXX=LXX	1210 FOR XX=1TO 4
600 FOR aX=1TO LEN A\$	910 6COL 3,4	1220 FOR YX=1TO 3
610 ?data=ASC (MID\$(A\$,a%,1))	:MOVE LXX,486	1230 DX=BX(X2X(XX),Y2X(YX))+BX(X2X(XX
620 XX=data MOD 256	:VDU 129)+1,Y2%(Y%)+1)+B%(X2%(X%)+2
:YX=data DIV 256	920 REPEAT	, Y2% (Y%) +2) +B% (X2% (X%) +3, Y2% (Y%)
: AZ=10	930 REPEAT	+3)
:CALL &FFF1	940 IF INKEY (-103) AND LX%>256LX%=LX	:IF D%=C% PROCvalid(%2%(%%)
630 FDR 62=0TO 1	7-128	,Y2%(Y%), X2%(X%)+1, Y2%(Y%)+1
640 VDU 23,6%+130	950 IF INKEY (-104) AND LXX<1024LXX=L	, X2%(X%)+2, Y2%(Y%)+2, X2%(X%)+3
650 FOR c%=0TD 3	XX+128	,Y2%(Y%)+3,C%)
:FOR d%=OTO 1	960 MOVE 0X%,486	1240 IF FLAG=0 D%=B%(X2%(X%)+3,Y2%(Y%
660 VDU data?(c%+b%+4+1)	:VDU 129))+B%(X2%(X%)+2,Y2%(Y%)+1)+B%(X2
670 NEXT	970 MOVE LXX,486	%(X%)+1,Y2%(Y%)+2)+B%(X2%(X%)
:NEXT	:VDU 129	, Y2% (Y%) +3)
:NEXT	980 IF 0X%(>LX%SOUND 0,1,1,4	:IF D%=C% PROCvalid(X2%(X%)+3
680 VDU 130,10,8,131,11	990 PROCdelay(2)	, Y2% (Y%) , X2% (X%) +2, Y2% (Y%) +1
690 NEXT	1000 0XX=LXX	, X2%(X%)+1, Y2%(Y%)+2, X2%(X%)
700 IF Z%<20R A\$="THINKING"SDUND 1	1010 UNTIL INKEY (-99)	, Y2%(Y%)+3,C%)
,1,RND(20)+200,12	1020 IXX=(LXX-256)DIV 128+1	1250 NEXT
710 ENDPROC	1030 IF YX(IXX)(6 YX(IXX)=YX(IXX)+1	:NEXT
720 DEF PROCprintboard	:FLAG=TRUE	1260 IF FLAG OR C%=10 ENDPROC
730 LOCAL XX, YX		1270 PROCshuffle(7,3)
740 COLOUR 129	ELSE SOUND 0,-15,2,25	1280 FOR XX=1TO 7
:CLS	1040 UNTIL FLAG	1290 FOR Y%=1TO 3
750 COLOUR 2	1050 MOVE LXX,486	1300 DX=BX(X2X(XX),Y2X(YX))+BX(X2X(XX
:PROCbig("Me: "+STR\$ me%,0	:VDU 129), Y2%(Y%)+1)+B%(X2%(X%), Y2%(Y%)+
,251	1060 B%([X%,Y%([X%))=5	2) +8% (%2% (%%) , Y2% (Y%) +3)
760 PROChig("Counters: 21",7,25)	1070 VDU 4	:IF DX=C% PROCvalid(X2%(X%)
770 COLOUR 3	1080 PROCprintcounter(IXX)	, Y2% (Y%) , X2% (X%) , Y2% (Y%) +1
:PROCbig("You: "+STR\$ you%	1090 PROCprintcountersleft(3)	, X2% (X%) , Y2% (Y%) +2, X2% (X%)
,0,28)	1100 ENDPROC	, Y2% (Y%) +3, C%)
780 PROCbig ("Counters: 21",7,28)	1110 DEF PROCcheckwin(C%)	1310 NEXT
790 VDU 28,2,19,18,2	1120 IF CX=-1	INEXT
:COLOUR 133	:REPEAT COX=RND(7)	1320 ENDPROC
:CLS	:UNTIL B%(CO%,6)=0	1330 DEF PROCMYGO
800 VDU 28,3,18,17,3	: YX (COX) = YX (COX) +1	1340 PROCcheckwin(4)
:COLOUR 128	: B%(CO%, Y%(CO%))=1	1350 IF FLAG ENDPROC
:CLS	:COLOUR 3	1360 PROCcheckwin(20)
810 COLOUR 1	:PROCprintcounter(CO%)	1370 IF FLAG ENDPROC
820 FOR XX=1TD 7	:FLAG=TRUE	1380 COLOUR 13
:FOR YX=0TO 6	:ENDPROC	:PROCEDIG ("THINKING", 3,0)
830 IF YXPRINT TAB(XX*2-1,YX*2)	1130 FLAG=FALSE	
CHR\$ 128	1140 PROCshuffle(4,6)	1390 PROCcheckwin(3) 1400 IF FLAG ENDPROC
:BX(XX,YX)=0	1150 FOR YX=1TO 6	
	1160 FOR XX=1TO 4	1410 PROCcheckwin(15)
:YX(XX)=0		1420 IF FLAG ENDPROC
FLCE DY (VY VY)-1	1170 DX=BX(X2X(XX),Y2X(YX))+BX(X2X(XX	1430 IF level=49 PROCcheckwin(-1)
ELSE B%(X%,Y%)=1)+1,Y2%(Y%))+B%(X2%(X%)+2,Y2%(Y%	:ENDPROC
840 NEXT))+B%(X2%(X%)+3,Y2%(Y%))	1440 PROCcheckwin(2)
: NEXT	:IF D%=C% PROCvalid(X2%(X%)	1450 IF FLAG ENDPROC
850 counters=42	, Y2% (Y%) , X2% (X%) +1 , Y2% (Y%)	1460 PROCcheckwin(10)
860 ENDPROC	, X2X (XX) +2, Y2X (YX) , X2X (XX) +3	1470 IF FLAG ENDPROC
870 DEF PROCinkey	, Y2% (Y%) ,C%))
880 LOCAL LX%, OX%, T%, FLAG	1180 NEXT	



BTOOL reaches the parts of BASIC that others cannot reach!

Further details available from DATAWARE

COST TIMES SPELLWISE

The spelin cheka forr the BBC mikro and Werdwyse. SPELLWISE is a machine code spelling checker with a 6000 word dictionary (3000 on tape) which can be expanded to include your own specialist vocabulary.

Tape Version £12 Disc Version £18

LANGUAGEWISE

LANGUAGEWISE allows you to prepare and print foreign text on your BBC Micro using WORDWISE and an EPSON FX80 printer. Most European languages at your fingertips for only £18 (disc only).



FLOPPYCAT:-DATAWARE CATALOGUE ON A REUSABLE 40 TRACK SINGLE DENSITY 5% INCH DISC WITH A 5 YEAR MANUFACTURER'S GUARANTEE. 2 GUINEAS (£2.10) All prices quoted include postage.

DATAWARE

FREEPOST SWINDON SN3 4BR

KAY-ESS

COMPUTER **PRODUCTS**

PROFESSIONAL PROGRAMS FOR THE MODEL B AND ELECTRON

NEW LOW SUMMER PRICES EACH TAPE ONLY £5.95

DESIGN (B)(E) "NEW VERSION"
If you enjoy the idea of creating your own user defined characters but are put off by the time consuming mathematics, then DESIGN is for you! DESIGN lets your imagination loose by letting you draw your characters, in all 16 colours, on an 8 × 8 grid leaving all the hard work to the machine. DESIGN's features include being able to recall multiple characters for re-editing and displaying VDU 23 commands. All characters used in KAY-ESS programs are created using DESIGN.

SPACE TRAFFIC CONTROLLER — "NEW" (B)(E)
As a space traffic controller you have been stationed at the main robot cargo port of the planet Ore-7. It is your job to get the robot spacecrafts down in one piece. As your confidence increases you can increase the number of crafts allowed withing your control area. Warning: not to be played after a hard or hectic day!

After your SPACE TANK has landed on the planet Orion, a series of alien tanks, surface hoppers, and spacecrafts will attack. How long can you hold out commander? This game makes use of the Beeb's fast scrolling ability. Can be used with either keyboard or joysticks. Top ten table. Pause option.

HORSES (B)(E)
Come on now, don't be shy, choose one of the six horses and let's see what you can do. How many of the fences can you complete at the Orion arena, especially with the clock ticking away? New riders can try one of the more docile horses while others may like to risk one of the more lively beasts! Can be used with either keyboard or joysticks. Top ten table. Pause option.

STAR HAWKS (B)(E)
Can you stop the STAR HAWKS before they stop you? Slow work means the
generation of more laser firing mutant hawks. Based on the games of Galaxian and
Gorf. Can be used with either keyboard or joysticks. Top eight table. Pause option.

HANGMAN (B)(E)
Let words become fun again with our three language, (ENGLISH, FRENCH, ITALIAN), version of the popular game of HANGMAN. There are 3 levels of play for each language. All words can be replaced or removed, and new ones can be added. HANGMAN comes with an instruction program giving full details for parents and teachers. Once running prying eyes cannot access the word lists!

EARLY YEARS (B)(E) For children between 3-6 years of age These two packages give an adult or older child a means to take a younger child through a series of simple game type tasks to enforce idea's. The emphasis is on learning through fun. Topics covered include subtraction, addition, recognition, colour, shapes, sizes, sounds/notes, co-ordination, distances, estimates, directions.

EARLY YEARS 1

A) MICKEY THE MONKEY and his apple tree make subtraction fun.
B) COLOUR BLOCKS bring sizes and colour into perspective.
C) MERRY MUSIC turns the keyboard into a musical keyboard.
D) FUNNY FACES presents a line up, which one is the suspect?
E) FRED THE FROG needs co-ordinated help to get across the pond.

A) THE POND seems very active today
 B) SPEED is required to keep the cake on the conveyor belt.
 C) DIRECTIONS seem to be needed by everyone in Orion village.
 D) ORDER the blacks.

D) ORDER the blocks.

E) SID THE SPIDER needs some help to get out of the maze.

All prices are FULLY inclusive for UK orders Please add £1 per tape for non-UK addresse Cheques/P.O.'s should be made payable to KAY-ESS Computer Products.

ELECTRON PROGRAM CAN BE USED WITH FIRST BYTE JOYSTICK INTERFACES

Watch out for special KAY-ESS double sided tapes at local dealers.

KAY-ESS computer products previously traded under the name of ORION SOFTWARE.

Available for: (E) Electron (B) BBC Model B FREE with all orders is our 3 level version of NOUGHTS AND CROSSES!!! **KAY-ESS Computer Products,** 11 Buttercup Close, Romleighs Park, Harold Wood, Essex RM3 0XF.

Quadline listing

From Page 136	1750 VDU 23,129,129,66,36,24,24	2070 PROChig("Press that space bar"
1400 VE 1 - 1 - 50 DDGG 1 - 1 - 1 1 1	,36,66,129	,0,18)
1480 IF level=50 PROCcheckwin(-1) :ENDPROC	1760 DIM B%(7,6), Y%(7), X1%(5), Y1%(5) , X2%(7), Y2%(6), data 9	:PROCbig("if you do!",5,21) 2080 *FX15,1
1490 PROCcheckwin(1)	1770 me%=0	2090 q=GET
1500 IF FLAG ENDPROC	:you%=0	:IF q=32ENDPROC
1510 PROCcheckwin(5)	: Z%=FALSE	i q-ozena noc
1520 IF FLAG ENDPROC	1780 ENVELOPE 1,4,0,0,0,2,1,8,45	ELSE CLS
1530 PROCcheckwin(-1)	,-9,0,-126,126,0	1VDU 31,8,15
1540 ENDPROC	1790 ENVELOPE 2,5,128,-25,-25,15	:PROCbig("bye!",1,2)
1550 DEF PROCvalid(X1X(1), Y1X(1)	,25,25,126,0,0,-1,126,126	:END
, X1%(2), Y1%(2), X1%(3), Y1%(3)	1800 ENDPROC	2100 DEF PROCdelay(T%)
,X1X(4),Y1X(4),CX)	1810 DEF PROCprintcounter(X%)	2110 LOCAL t%
1560 LOCAL COX	1820 LOCAL TX	2120 t%=TIME
1570 IF C%=40R C%=20someonewins=C%	1830 IF colour=2	:REPEAT UNTIL TIME >t%+T%+10
:FLAG=TRUE	:PROCbig(" ",3,0)	2130 ENDPROC
:PROCshowwinner(X1%(1),Y1%(1)	1840 FOR TX=6TO YX(XX)STEP -1	2140 DEF PROCshuffle(X%,Y%)
, X1X(2), Y1X(2), X1X(3), Y1X(3)	1850 COLOUR colour	2150 LOCAL T%,q%,Z%,FLAG
,X1X(4),Y1X(4),CX)	1860 PRINT TAB(XX*2-1,(7-TX)*2)	2160 FOR TX=1TO XX
:ENDPROC	CHR\$ 128	:X2%(T%)=0
1580 REPEAT	1870 SOUND 1,1,TX*20+50,5	:NEXT
1590 CO%=RND(4)	1880 TIME =0	2170 FOR TX=1TO YX
1600 UNTIL BX(X1X(COX), Y1X(COX))=0	:REPEAT UNTIL TIME >20	:Y2%(T%)=0
AND BX(X1%(COX+1),Y1%(COX+1))(>0	1890 COLOUR 1	:NEXT
OR BX(X1X(COX), Y1X(COX))=0	1900 IF T%>Y%(X%)PRINT TAB(X%*2-1	2180 T%=1
AND BX(X1X(COX-1), Y1X(COX-1))(>0	,(7-T%)*2)CHR\$ 128	:REPEAT
1610 IF BX(X1X(COX), Y1X(COX)-1)<>0	1910 NEXT	2190 FLAG=FALSE
AND BX(X1X(COX), Y1X(COX))=0	1920 ENDPROC	2200 q%=RND(X%)
THEN BX(X1X(COX), Y1X(COX))=1	1930 DEF PROCprintcountersleft(colour	FOR Z%=1TO T%
: YX (X1X (COX)) = YX (X1X (COX))+1	1940 counters=counters-1	:IF q%=X2%(Z%)
:COLOUR 2	1950 VDU 26	THEN Z%=T%+1
:PROCprintcounter(X1%(CO%))	1960 COLOUR colour	:FLAG=TRUE
:FLAG=TRUE	:COLOUR 129	2210 NEXT
: X%=10	1970 PROCbig(STR\$ (counters DIV 2)+	2220 IF NOT FLAG AND TX(XX+1 X2X(TX)=
:YX=10	" ",17,25+((colour-2)*3))	q%
:C0%=5	1980 VDU 28,3,18,17,3	:TX=TX+1
	1990 COLOUR 128	2230 UNTIL TX>XX
ELSE FLAG=FALSE	2000 ENDPROC	2240 TX=1
1620 ENDPROC	2010 DEF PROCawinner (C%,c%)	:REPEAT
1630 DEF PROCshowwinner (X1%(1), Y1%(1)	2020 VDU 26	2250 FLAG=FALSE
, X1%(2), Y1%(2), X1%(3), Y1%(3)	2030 CLS	2260 q%=RND(Y%)
,X1%(4),Y1%(4),C%)	2040 COLOUR 6	:FOR ZX=1TO TX
1640 SOUND 1,2,20,200	2050 IF C%=4AND c% PROCbig("I the	:IF q%=Y2%(Z%)
1650 LOCAL TZ	mighty one",2,4)	THEN ZZ=TX+1
1660 IF CX=4COLOUR 9	:PROCbig("win again!",5,7)	:FLAG=TRUE
ELSE COLOUR 11		2270 NEXT
1670 FOR TX=1TO 4	ELSE IF C%=20AND c% PROCbig(2280 IF NOT FLAG AND T%(Y%+1 Y2%(T%)=
1680 PRINT TAB(X1%(T%)*2-1,(7-Y1%(T%)	"Unfortunatly you",2,4)	qX
)*2)CHR\$ 128	:PROCbig("appear to have won."	: TX=TX+1
1690 NEXT	,1,7)	2290 UNTIL T%>Y%
1700 PROCdelay(50)	ELSE PROCbig("We seem to have"	2300 ENDPROC
1710 ENDPROC	,2,4)	
1720 DEF PROCinit	:PROCbig("drawn.",7,8)	
1730 VDU 19,0,4,0,0,0,19,1,0,0,0	2060 PROCbig("I suppose that you"	This listing is included in this
,0,19,4,13,0,0,0	1,12)	month's cassette tape offer. See
1740 VDU 23,128,60,126,255,255,255	:PROChig("want another game!"	order form on Page 165.

,1,15)

order form on Page 165.

,255,126,60

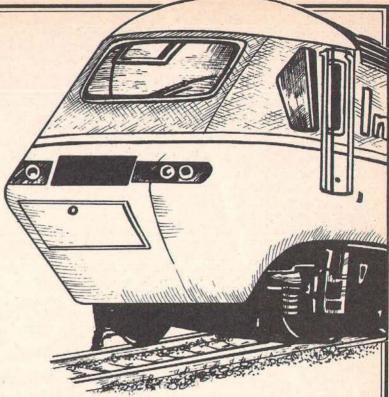
DRIVE IT!

Can you be entrusted with the controls of one of the world fastest and most famous trains, with this simulation you have the opportunity. The controls are yours, but you must obey signals and line speed along with a demanding schedule.

Will you get your train in on time?

Your performance will be monitored for end of game percentage rating providing that you have not been relieved of the controls for endangering the lives of your passengers

A comprehensive booklet is provided giving full route information and details that will help you drive the locomotives. There is a choice of engines besides the High Speed Train (H.S.T.), Deltic and Brush 47 with different handling characteristics for operating a slower schedule.



Flying Scotsman

For BBC Model B (also Spectrum 48K) £7.50 inc p&p.

from

Dee-Kay Systems, 18 Salford Close, Woodrow South, Redditch Worcs B98 7UN.

DO YOU WANT A WORD PROCESSOR FOR YOUR BBC OR A WORD PROCESSOR FOR YOUR BBC ?

Yes there is a difference between word processors and we can offer the best because it's the FIRST PROFESSIONAL DISC BASED WORD PROCESSOR FOR THE BBC COMPUTER.

The MERLIN SCRIBE uses the disc on your computer the same way that professional systems costing many hundreds of pounds do.

Until now any document you wished to create has been limited to the few pages which could be squeezed into your computer memory. This means the computer is really using the disc as if it were a cassette!

The SCRIBE can create documents far greater in size than the computer memory, and really uses the disc as it was intended to be used. SCRIBE automatically loads and offloads pages between disc and memory without you even knowing it's happening!

Amongst the many super features available are:

- * Optional 40 & 80 column screen format selection.
- * On screen formatting you see it as it's printed INCLUDING UNDERLINING.
- * Right justify, word wrap, insert, delete, move copy & centre.
- * Document merge (will merge two documents into one from disc).
- * Addresses all four drive units allowed by your BBC disc system.

Plus many more professional features.

SCRIBE comes in ROM with five minute fitting instructions, printer utilities on disc and a comprehensive manual.

PRICE £59.95

All prices include VAT. Post and Packaging 60p.

VISA

MERLIN COMPUTER PRODUCTS (BUCON LIMITED)
35-36 SINGLETON STREET, SWANSEA, SA1 3QN. TEL (0792) 467980





Add the power of ROM based software to your micro!

Turn your micro into a word processor, a disassembler, a multi-language machine, or a communications terminal - at the flick of a switch!

Once there was a physical limit to the number of ROMs you could use. But with our ROM extension socket you can now gain access to an infinite number of ROMs quickly - and safely.

- Zero-force insertion socket protects valuable eproms from damage
- Easy to install no solderina
- Fits into the ashtray for easy access - no need to meddle with the micro's innards
- Full, simple to follow instructions supplied



EXPERIENCE A GREAT NEW DIMENSION IN MICRO SOUND!

The National Micro Centres hi-fi adapter allows you to bypass the BBC Micro's internal speaker and feed the sound signal into your own hi-fi or music centre.

- Easy to install no soldering
- Three-position switch allows use of internal or external speaker - or turns off sound completely
- Full instructions supplied
- Fully isolated unit
- Much more than an additional speaker - allows full use of your amplifier's controls

Hi-fi adapter Inc.VAT Carriage free

☐ Please supply ___ . Hi-fi adapter(s) at £19.95 each inc. VAT ☐ Please supply _____ ROM extension sockets at £22.95 each inc. VAT ☐ I enclose a cheque/PO No. . for £ _____ made payable to: National Micro Centres ☐ Please charge my credit card No. _

POST TO: NMC, 36 St. Petersgate, Stockport SK1 1HL

ROM extension socket arriage fr

> National Micro Centres

STACK 100

LIGHTPEN,

ATARI...VIC-20...CBM 64
A beautifully styled, high
quality colour light pen for the
BBC, with touch controls.



Easy to use...simply hold the LIGHT PEN against the T.V. screen, place a finger on the 'Touch Contact' and the pen is working. You can produce programs in which the LIGHT PEN places data (alphanumeric or graphical) onto the screen, removes data from the screen

or triggers off a series of events or instructions.

Complete with user manual and a free game on cassette (worth £5.75) to get your software library started.

ONLY £28.75 incl. VAT

Stack Products are available from selected branches of: GREENS DEBENHAMS, DIXONS, JOHN MENZIES, SPECTRUM, W.H. SMITHS

HOW TO ORDER

Most computer dealers either stock or can obtain **STACK 100** products for you, or you may order direct from us. Packaging and postage is FREE within the U.K., overseas customers please add airmail postage.

Payment may be made by sending a cheque, postal order or by credit card, 24hr answerphone service.

Please send me full details of your BBC products.

Name .		 _		
			-	

GRAPHIX-ED

An excellent colour graphics program for your BBC. Easy to use, but be warned, any slight interest in graphics can quickly become an addiction!

- use normal, medium or hi-res graphics
- choose 1, 4 or 16 colours

controlled by single letter commands

- optional grid display to aid accuracy
- duplicate pictures on other parts of the screen
- picture buffer
- save and recall pictures from cassette
- comprehensive user manual
- quick reference guide to commands

THE COMPLETE £9.00 incl. VAT

Full joystick control — in any direction — and it fires too!!

ONLY £13.80 incl. VAT

STACK 100

FREEPOST BOOTLE, MERSEYSIDE L20 0AB

0519335511

24hr answerphone

BBC JOYSTICK

from BELTECH

Software that doesn't insult your intelligence

FOR BBC MODEL B - SPECTRUM 48K - COMMODORE 64K

BEL BASE by John Marshall B.Sc. Comprehensive Data Base with 20 Field

Records containing up to 150 Characters, Alpha/ Numeric, Amend, Insert, Delete, Sum, Save, User Defined Report Formats, Step Through.

BELGRAPH Advanced Function Plotting. Input your own Equations, Parametrics, Bar Chart, Pie Chart, Line Graph, Input Data from File or Keyboard, Edit, Save, Name Records. Sort.

BEL CHEM by Andrew Chapman B.Sc.
Professionally written revision package to 'O' Level.

Fully Documented, User Friendly. Explanations, Examples, Tests, Illustrations.

Examples, Tests, Illustrations.

CHEM ONE – Moles, Formulae, Reacting Masses & Volumes, Gases.

CHEM TWO — Balancing Equations, Atomic Structure & Bonding, Rates of Reaction, Electrolysis, Energy Changes.

BELGEN Keep your Family Geneological Records in a modern professional way. Keyboard/File entry/Edit. Keyboard Searches:-Names, Dates, Places, Births, Marriages, Deaths. Male & Female Lines. These, and many other User Friendly Menu Options.

SERVICE ~5 STAR PLUS * Despatch normally within 24 hrs.
* VAT, p & p included. * Back up and data tape. * User booklet with each program.



BEL PLAN BEL STAT

* Registered user advice service. * Institutional orders accepted.

BEL MATHS 1&2
BEL PHYSICS 1&2

BEL TECH Limited, Stammore Industrial Estate, Bridgnorth, Shropshire. WV15 5HP Telephone: 07462 5420 (24 Hrs.)



Order rm	TAP	TAPE		С	TOTAL
O. Fo.		QTY		QTY	
BEL BASE	13.65		15.25		
BEL GRAPH	14.89		16.45		
BEL CHEM Chemistry 1	8.50		10.35	-	
Chemistry 2	8.50		10.35		
BEL GEN Geneology	12.50		13.99		

TOTAL inc. P. & P. &

NAME	
ADDRESS	

COMPUTER TYPE ______MODEL ____
DISC (if applic.) ____
CREDIT CARD No. PAYMENT BY CHEQUE, P.O., VISA, ACCESS.

Please Complete & Return to:-BEL TECH Limited, Stanmore Industrial Estate, Bridgnorth, Shropshire. WV15 5HP. or Telephone: 07462 5420 (24 Hrs.)

Silverlind

SILVERLIND LTD. 156 Newton Road, Burton-on-Trent Staffs. DE15 0TR. Tel (0283) 63987

TOWNTEST BBC/B £6.50
A very useful aid for teaching Geography in primary schools, this program tests pupils' knowledge of the locations of major towns and cities in England, Scotland and Wales. Well presented, with a high-resolution map.

BIOLOGY
A suite of programs using text, animated diagrams, examples, and questions to assist in the understanding of Biology to CSE, 'O' and 'A' Level standards, Most suited to individual use by students, these programs also contain material teachers can extract for classroom demonstration. Topics covered include the Eye, Ear, Heart, Blood and Circulation, Skeleton, Female reproduction, Genetics, Biochemistry and the Central Nervous System.

ENJOY MATHS 48K Spectrum £8.00
A suite of 4 highly motivating programs for the 8 - 14 age range: tables, simple equations, polygons and areas. The programs combine explanation with tests and make good use of colour and sound.

MASTER DIET PLANNER 48K Spectrum £11.95
The ultimate in diet programs, the MASTER DIET PLANNER contains details of calories, protein, vitamins and other nutrients for 681 foods! The MASTER DIET PLANNER will help you plan a well-balanced diet, including options to restrict fats, cholesterol and salt, or to increase fibre intake-at the same time offering maximum choice of foods. Instructions and Recipe Book included.

ALL PRICES INCLUDE POST & PACKING & VAT

We require good programs to increase our catalogue and pay high royalty rates for published material.

BRIDGE 51FIWARF THE NIGHT SKY

(for BBC micro Model B and Electron)

An observer's guide to the stars visible anywhere in the world from Arctic to Antarctic Circles Discover the fascination of the limitless heavens.

Create brilliant hi-res starcharts with THE NIGHT SKY and your BBC micro/Electron

- Features over 1000 different stars
- 5 magnitudes distinguished
- 87 constellations identifiable
- Many millions of different skyscapes
- Sky colour indicates day, night or twilight
- Ideal for serious astronomers and novices alike
- Make your TV screen a mini planetarium
- Navigation stars named

Trace the movements of the constellations minute by minute, night by night

Send £9.90 for cassette/£11.90 for 40-track disk

Send s.a.e. for full list of all our software Full money back guarantee.



Trade enquiries welcome

Dept BU, 36 Fernwood, Marple Bridge, Stockport, Cheshire, SK6 5BE, England.

- * SPY
- * DEBUG
- * CTRLF
- * BRK
- * NOCTRLF
- * NOBRK
- * CLST
- * HLST
- * XLST
- * FTRACE
- * TRACE
- * WHAT
- * AXY
- * AMEND
- * MAKE
- * STAT
- * DEDIT
- * REFORMAT
- * FORMAT
- * VERIFY
 * WHERE
- * MLOAD
- * MRUN
- powerful disc recovery utilities

£30.00

inc VAT

SPY2 is the new comprehensive debugging monitor, dis-assembler and disc utility ROM from SYSTEM.

SPY2 encompasses all the superb easy-to-use facilities of the renowned

SPY debugging monitor, additional front panel commands, a new set of powerful disc recovery utilities, a formatter, a relocator, program trace facilities and a versatile disassembler.

- * inspect, single-step through or dis-assemble ANY ROM
- * single-step through subroutines in one go
- * toggle/clear breakpoints
- * colour or black and white front panel display option
- * hex dump, full or intelligent dis-assembly option
- * disc sector editor with hex and ASCII display
- * recover and reformat bad track
- * find string or hex code on disc
- * unstoppable verify disc utility
- * find disc space
- create and amend disc catalogue entry
- * download (and run) disc file

SYSTEM SOFTWARE Dept. B 12 Collegiate Crescent Sheffield S10 2BA

Toolkit listing

From Page 111

Listing I

- 10 HIMEM =&6000
- 20 jmp=&7800
- 30 PROCassemble(2)
- 40 init=jap
 - : read=jmp+3
- 50 write=jmp+6
- 60 seek=jmp+9
 - : readID=imp+&OC
- 70 format=jmp+&OF
- : verify=jmp+&12
- 80 mkcat=jmp+&15
- 90 BX=HIMEM
 - : D%=0
 - : CALL init
- 100 guit%=FALSE
- 110 REPEAT
- 120 REPEAT
- 130 INPUT "Read, Write, Seek, readId , Format, Verify or Quit? "Q\$
- 140 QZ=INSTR("RrWwSsIiFfVvQq",Q\$)
- 150 UNTIL 0%>0
- 160 Q%=(Q%+1)DIV 2
 - : ON QX GOTO 280 ,320 ,360
 - ,400 ,480 ,200 ,180
- 170 REM _____
- 180 quitZ=TRUE
- : GOTO 610
 - : onin oto
- 190 REM ___
 - Verify
- 200 INPUT "Enter starting track and number of tracks", IX, NX
- 210 FOR TX=IX TO IX+NX-1
- 220 CALL verify
- 230 2%=4
 - : PRINT TX;
- 240 NEXT
- 250 PRINT
- 260 GOTO 600
- 270 REM ___
 - Read
- 280 INPUT "Enter track, sector and number of sectors", TX, SX, NX
- 290 CALL read
- 300 6010 600
- 310 REM ____
- 320 INPUT "Enter track, sector and number of sectors", TX,SX,NX
- 330 CALL write
- 340 GOTO 600
- 350 REM .
- Seek
- 360 INPUT "Enter track", T%
- 370 CALL seek
- 380 GOTO 600

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are in the July 1983 issue of The Micro User.

390 REM ____

- Read ID
- 400 INPUT "Enter track and no of fields", TX. NX
- 410 CALL readID
- 420 PRINT "ID fields"'" Trk Hd Sec Len"
- 430 8%=4
 - : FOR 1%=8% TO 8%+N%*4-1
- STEP 4
- 440 FOR JZ=1Z TO 1Z+3
 - : PRINT ~?J%;
 - : NEXT
 - : PRINT
- 450 NEXT
- 460 GOTO 600
- 470 REM ___
 - Format
- 480 INPUT "Enter no of tracks" .F%
- 490 IF F%=40 OR F%=80 P%=0
 - : 0%=F%-1
 - : INPUT "Formatting the whole
 - disk, OK? "Y\$
 - : MX=FX
 - : GOTO 510
- 500 8%=0
 - : INPUT "Starting track? "P%
 - : Q%=P%+F%-1
 - : PRINT "Formatting tracks "P%
 - " to "Q%;
 - :INPUT ", OK?"Y\$
- 510 IF INSTR("Yy", Y\$)=0 GOTO 610
- 520 N%=10
- 530 FOR T%=P% TO Q%
- 540 CALL format
- 550 @%=4
 - : PRINT TZ;
- 560 NEXT
- 570 PRINT
- 580 IF P%=0 T%=M%
 - : CALL mkcat
- 590 GOTO 600
- 600 REM PROCprt_fcb(jmp)
- 610 PRINT
 - : UNTIL quit%
- 620 END
- 630 DEF PROCert fcb(jmp)
- 640 PRINT "Error byte: "~jmp?&19
- 650 PRINT "Drive "jmp?&1A", buffer
 - "~jmp!&1B
- 660 PRINT "Npars "jmp?&1F", command

- ""jap?&20
- 670 PRINT "Track "jmp?&21", sector
 - "jap?&22
- 680 P%=jmp+&23
 - : Q%=jmp+&20+jmp?&1F
- 690 PRINT "Parameters ":
- 700 FOR KX=PX TO QX
 - : PRINT "?K%;
 - : NEXT
 - : PRINT
- 710 ENDPROC
- 720 DEF PROCassemble(L%)
- 730 REM 8271 disc controller utiliti
- es 23. jan 83
- 740 REM
- 750 osasci=&FFE3
- 760 osword=&FFF1
- 770 REM
- 780 REM Zero page usage.
- 790 ptr=&70
- 800 REM
- 810 FOR pass=0 TO 1
- 820 P%=jmp
- 830 COPT pass#L%
- 840 \ Jump table for Basic entries.
- 850 jmp initfcb
- 860 jap read
- 870 imp write
- 880 jmp seek
- 890 jmp readID
- 900 jmp format
- 910 jmp verify 920 jmp mkcat
- 930 \
- 940 .scan EQUB 0 \ a scan operation?
- 950 .error EQUB 0 \ error byte
- 960 1
- 970 fcb =P%
- 980 COPT pass*L%
- 990 .drive EQUB 0
- 1000 .bufadr EQUD 0
- 1010 .npars EQUB 0 \ no of parameters to command
- 1020 .cmmd EQUB 0 \ 8271 command
- 1030 .track EQUB 0
- 1040 .sector EQUB 0
- 1050 1
- 1060 P%=P%+4
 - : REM parameter space
- 1070 REM
- 1080 REM 8271 commands.
- 1090 cmdscn = &40
- : REM scan data
- 1100 cmdwr = &4B
- : REM write data 1110 cmdrd = &53
- : REM read data 1120 cmdrID = &58



TWO PLAYER GAMES DUET

Choose between playing against a friend or the computer and choose between 4LINE and FRUSTRATION, two classics in one. There's also a joystick option. The choice is



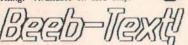
ROBO BRAIN

Control the Gremlins to disable the mad Robot's positronic brain, but avoid the deadly Pulses which have been sent out by the robot to get you! Work fast, because those pulses reverse any work you've achieved.



BEEB-TEXT

A sophisticated and highly original machine-code program which allows virtually unlimited variation in style of displayed text including shadow, outline, italic, thickness, height, width, line spacing, colour combinations, etc. Eight fonts are available in modes 4 and 5 and it is ideal for imaginative displays and titling - especially vide titling. Available on disc only.



ADrop us a line for our detailed catalogue and price list.

PROXIMA SOFTWARE has been chosen as the official publisher of the following BBC and ELECTRON programs written by members of the COMPUTER USERS CLUB, in addition to our own forthcoming software.

GAMES QUARTET

PIXEL PACKAGE

Full value and variety from four colourful and exciting action and strategy games for the price of one, including TRAWLER, LIGHT CYCLES, STARGAME and an almost unbeatable 3D TIC-TAC-TOE.

Two machine-code programs for the price of one. Firstly there's an excellent single colour character designer and secondly a four colour



DISC TOOLS

A Utility Disc especially useful for users of twin 80 track drives including users of twin 80 track drives including a 40/80 track backing up facility, a disc identifier & verifier, a 35/40/80 track formatter with automatic verification and a comprehensive menufile.



PERSONAL

COMPUTER SOFTWARE

BIG PRINT

By the author of Beeb-Text, this is a machine-code routine which can be incorporated into your own programs to display variable size height and



(from 16 colour palette) character designer and print routine. PROXIMA PERSONAL COMPUTER SOFTWARE, Newlands, 30 Spareleaze Hill, Loughton, Essex, IG10 1BT. Tel. 01-502-0230

BBC model B		
	Disc	Cassette
DISC TOOLS	£10.95	
BEEB-TEXT	£15.00	
PIXEL PACKAGE *	£10.95	£7.95
BIG PRINT *	£8.95	£5.95
TWO PLAYER GAMES DUET *	£9.95	£6.95
GAMES QUARTET	£10.95	£7.95
ROBOBRAIN	£10.95	£7.95
Advertible on Plantage		

*Contact us, because we have a limted Special Offer, we are GIVING programs away with all orders. Please write or phone for details.

▲ From this month onward, P&P on all orders is FREE!

APrices are fully inclusive, no extra to pay.

*Available on Electron

APlease specify 40 or 80 track or 3" types when ordering discs.
APlease make cheques/P.O's payable to PROXIMA SOFTWARE.

TUTORIAL SOFTWARE PROGRAMMED AIDS FOR BETTER GRADES

MAYDA



Can you use co-ordinates, grid references, bearings and scales to save the stricken tanker?

A new concept in Educational programs, MAYDAY offers:

- Two compelling new games in one package.
- Playing the game teaches and tests compulsory aspects of Mathematics and

Geography.
Used and recommended by Schools and Colleges for ages 11-16 plus.

Package includes map, grid protractor, core facts book, simulation program, multiple choice program, all for £11.95 free p + p.

	Please send me a copy/ copies of the TSL 'MAYDAY' Teaching Package for the BBC B.
	I enclose a cheque/P.O. for £11-95
4	Name
1	Address
1	Cimpature
	Signature

TUTORIAL SOFTWARE LTD. FREEPOST WIRRAL, MERSEYSIDE L61 1AB.

Toolkit listing

1490 rts

1500 \

From Page 143	1510 \ Read N% sectors starting	2040 \ Format track TZ.
	at sector S% on track T%.	2050 \ The buffer in BZ must be
: REM read ID fields	1520 \ Buffer address & drive must	at least 40 bytes long.
1130 cmdver = &5F	be set up before this call.	2060 \ N% is the number of sectors
: REM verify data	1530 .read lda #cmdrd	per track.
1140 cadfa = &63	1540 .setpar	2070 .format
: REM format track 1150 cmdsk = &69	1550 sta camd	2080 lda #0
: REM seek track	1560 lda #0 1570 sta scan	2090 sta scan \ not a scan 2100 lda B
1160 REM	1580 Ida #3	2110 sta ptr
1170 gap1 = 22-6	1590 sta npars	2120 Ida B+1
: REM formatting	1600 lda S	2130 sta ptr+1
1180 gap3 = 27-6	1610 sta sector	2140 lda D
: REM formatting	1620 jsr nsect	2150 and #1
1190 REM	1630 sta fcb+9	2160 sta H
1200 T40 = 40*10	1640 .settrk	2170 Ida N \ number of sectors/track
: REM sectors on a 40-track	1650 lda T	2180 tax
disc	1660 sta track	2190 asl A
1210 T80 = 80*10	1670 \	2200 asl A \ times 4
: REM sectors on an 80-track	1680 .osw lda #&7F	2210 tay
disc	1690 ldx #fcb MOD 256	2220 dey \ start with #sectors-1
1220 REM	1700 ldy #fcb DIV 256	2230 .form1 dex \ count the sectors
1230 REM Basic resident integer	1710 jsr osword	2240 lda #1 \ sector size (=256
variables.	1720 jsr erresg	bytes)
1240 B=FNintvar("B")	1730 rts	2250 sta (ptr),Y \ track
: REM buffer address	1740 \	2260 dey
1250 D=FNintvar("D")	1750 \ Write N% sectors starting	2270 txa \ number of sector in track
: REM drive O.	at sector S% on track T%.	2280 sta (ptr),Y
1260 H=FNintvar("H")	1760 \ The buffer address and the	2290 dey
: REM head (drive AND 1)	drive must be set up before	2300 lda H \ head (0 or 1)
1270 N=FNintvar("N")	1770 \ the call.	2310 sta (ptr).Y
: REM no of sectors	1780 .write lda #c@dwr	2320 dey
1280 S=FNintvar("S") : REM sector	1790 jmp setpar	2330 lda T \ set up the ID fields
1290 T=FNintvar("T")	1800 \	2340 sta (ptr),Y
: REM track	1810 \ Seek track T%; drive must be set before call.	2350 dey
1300 COPT pass+L%	1820 .seek lda #1	2360 bpl form1 2370 \
1310 .initfcb	1830 sta npars	2380 \ Now write the track.
1320 1da D	1840 lda #cmdsk	2390 lda #5
1330 sta drive	1850 jmp setpar	2400 sta npars
1340 ldx #4	1860 \	2410 lda #cmdfm
1350 .init1 lda B-1,X	1870 \ Read ID fields from track	
1360 sta fcb,X	T% - the number of fields	
1370 dex	1880 \ to read is in N% (max 10).	2440 sta track
1380 bne init1	1890 .readID	2450 lda #gap3
1390 rts	1900 lda #cmdrID	2460 sta fcb+8
1400 \	1910 sta cand	2470 lda N
1410 \ Get number of sectors - must	1920 lda #0	2480 ora #&20 \ 256 byte sectors
not exceed 10-S%.	1930 sta scan	2490 sta fcb+9
1420 .nsect 1da #10	1940 sta sector	2500 lda #0 \ mini disk
1430 sec	1950 lda #3	2510 sta fcb+10
1440 sbc S	1960 sta npars	2520 lda #gap1
1450 cmp N	1970 lda #10	2530 sta fcb+11
1460 bcc PX+5 \ NX>10-SX - make	1980 cmp N	2540 jmp osw
it 10-5%	1990 bcc PX+5 \ N>10 - use 10	2550 \
1470 lda N \ N%<=10-5%	2000 lda N	2560 \ Verify track T% - drive must
1480 ora #&20	2010 sta fcb+9	be set up before a call.

2020 jap settrk

2030 \

MORE MONIT RTHEMON

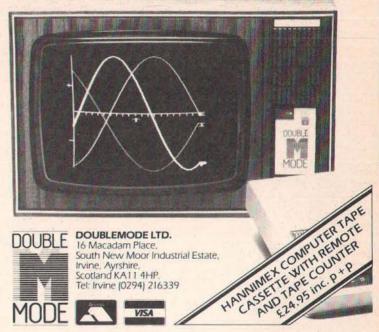
DOUBLEMODE RGB MONITOR 20", 22", 26" £97.75

Carriage £7.00 including free lead to suit **BBC** or Electron

The Doublemode RGB colour monitor cuts the cost of computer hardware to the BBC and Electron user. A top quality re-cycled T.V. originally developed for educational use, factory reconditioned and tested to BSI standards, including mains isolating transformer with 5 year quarantee.

3 MONTH **FULL REPLACEMENT GUARANTEE**

Educational and computer club discounts available. Trade enquiries welcome.



Don't be fooled, these really are BASIC commands. and they can of course use any BASIC variable or expression, be situated in multi-statement lines, be used in line-entry mode, and in fact anywhere or anytime that the standard BBC BASIC commands can be used. No other sideways-ROM offers such facilities, they use 'star commands' that cannot match the ease of use of ADDCOMM's commands.



Graphics: SCALE, SMOVE, SDRAW, SPLOT, CIRCLE, ELLIPSE, CFILL, FILL, ROTATE, TRANS, UNSCALE, Toolkit: CHAR, FIND, COMPACT, MEM, FKEYS, VERIFY, GOODPROG, KILLREM, GREPL, SREPL, LVAR. Logo: ANGLE, LMOVE, PEN, TURN, ADVANCE, LCIRCLE, LELLIPSE, LPOS. Utilities: POPFOR, POPGOS, POPREP, LGOTO, OPT, LLIST, SORT, ADDCOMM, WIN, SETWIN, and an extensive *HELP

Compatible with: Acorn DFS, Amcom DFS, Watford DFS, Disc Doctor, BASIC 1 and 2, Model B with OS 1.20.

COMMANDS TO BBC BASIC

ADDCOMM is as unique as it sounds, and at £28.00 including V.A.T., post and packing and a detailed manual, represents extremely good value for money.

Send cheque/postal order, (or a stamp for detailed brochure) to:-VINE MICROS, MARSHBOROUGH, SANDWICH, KENT. CT13 OPG

Toolkit listing

3030 \ sectors on the disc and byte 3580 \ .

From Page 145	7 contains the low order byte.	3590 \ Convert the byte in A (0 (= A < 100) to decimal.
	3050 cmp T	3600 .cnvt ldx #0
2570 .verify	3060 bcs P%+8	3610 cmp #10
2580 1da #5	3070 1da #T80 MOD 256	3620 bcc cnytlo
2590 sta npars	3080 ldx #T80 DIV 256	3630 inx
2600 lda #cmdver	3090 bne P%+6	3640 sec
2610 sta cmmd	3100 lda #T40 MOD 256	3650 sbc #10
2620 1da T	3110 ldx #T40 DIV 256	3660 bne cnvt+2
2630 sta track	3120 1dv #6	3670 .cnvtlo
2640 1da #0	3130 sta (ptr).Y	3680 ora #ASC "0"
2650 sta sector	3140 iny	3690 tay \ save lo digit in Y
2660 Ida #&29 \ number & size of	3150 txa	3700 txa
sectors	3160 sta (ptr).Y	3710 ora #ASC "O"\ hi digit in A
2670 sta +cb+9	3170 lda #1	3720 rts
2680 jmp osw	3180 sta sector	3730 \
2690 \	3190 jmp osw	3740 .prtmsg
2700 \ Initialise the (Acorn) catalog	3200 \	3750 ldy #0
in sectors 0 & 1.	3210 \ The disc controller error	
2710 \ The drive and buffer must	messages.	3760 lda (ptr).Y
have been set up before	3220 .errmsq	3770 beg prtfin
2720 \ a call - the buffer need	3230 lda &FE81 \ FDC result register	3780 jsr osasci
only be 256 bytes long.	3240 sta error	3790 iny
2730 \ This routine is used directly	3250 bne P2+8	3800 bne prtmsq+2
after formatting an entire	3260 lda scan	3810 .prtfin
2740 \ disk - and expects T% to	3270 bne P%+3	3820 rts
be the number of tracks	3280 rts \ code is 0 and not scan	3830 \
2750 \ on the disk.	-> no error	3840 \ The message table.
2760 .okcat lda B	3290 \	3850 \ completion
2770 sta ptr	3300 \ Find the message.	3860 \ type code
2780 1da B+1	3310 \	3870 .msgtb1
2790 sta ptr+1	3320 lda error	3880 EQUW scannot \ 00 00
2800 ldv #0 \ make 256 zeros for	3330 and #%1E	3890 EQUW scanEQ \ 00 01
sector 0		3900 EQUW scanNE \ 00 10
2810 tva	3340 tax : already times 2	3910 EQUW unkn \ 00 11
2820 sta (ptr).Y	3350 lda msqtbl.X	3920 EQUW clock \ 01 00
**************************************	3360 sta ptr	3930 EQUW dma \ 01 01
2830 dey 2840 bne P%-3	3370 lda msgtbl+1.X	3940 EQUW idCRC \ 01 10
	3380 sta ptr+1	3950 EQUW dataCRC \ 01 11
2850 \ Write the zeros to the sector.	3390 jsr prtmsq	3960 EQUW drRdy \ 10 00
2860 lda #3	3400 \	3970 EQUW wprot \ 10 01
2870 sta npars	3410 \ Print track and sector where	3980 EQUW trk0 \ 10 10
2880 lda #cmdwr	the read started.	3990 ERUW wrtflt \ 10 11
2890 sta comd	3420 Ida track	4000 EQUW secNF \ 11 00
2900 lda #0	3430 jsr cnvt	4010 EQUW unkn \ 11 01
2910 sta track	3440 sta trk	4020 EQUW unkn \ 11 10
2920 sta sector	3450 sty trk+1	4030 EQUW unkn \ 11 11
2930 lda #&21	3460 \	4040 \
2940 sta fcb+9	3470 Ida sector	4050 \ Messages
2950 lda #&7F	3480 jsr cnvt	4060 .scannot EQUS "Scan not met"
2960 ldx #fcb MOD 256	3490 sta sec	4070 EQUB 0
2970 ldy #fcb DIV 256	3500 sty sec+1	4080 .scanEQ EQUS "Scan met equal"
2980 jsr osword	3510 lda #at MOD 256	4090 EQUB 0
2990 jsr errmsg	3520 sta ptr	4100 .scanNE EQUS "Scan met not equal
3000 /	3530 lda #at DIV 256	b
3010 \ Sector 1 is also zero except	3540 sta ptr+1	4110 EQUB 0
for bytes 6 & 7:	3550 jsr prtmsg	4120 .unkn EQUS "Unknown error"
3020 \ byte 6 contains the high	3560 .errfin	4130 EQUB 0
order bits of the number of	3570 rts	
7070 1 1 11 12 1		

Toolkit listing

Enom Daga 147		: P%=P%+
From Page 147	: PX=PX+1	: REM 01
4140 .clock EQUS "Clock error"	1020 cend =P%	4100 !P% = da
4150 EQUB 0	: ?PX=0	: PX=PX+
4160 .dma EQUS "Late DMA"	: PX=PX+1	: REM 01
4170 EQUB 0	1030 track =P%	4110 !P% = dr
4180 .idCRC EQUS "ID CRC error"	: ?PX=0	: P%=P%+
4190 EQUB 0	: PX=PX+1	: REM 10
4200 .dataCRC EQUS "Data CRC error"	1040 sector=P%	4120 !P% = wp
4210 EQUB 0	: ?P%=0	: P%=P%+
4220 .drRdy EQUS "Drive not ready"	: PX=PX+1	: REM 10
4230 EQUB 0	1050 REM	4130 !P% = tr
4240 .wprot EQUS "Disc write protecte	3830 1	: P%=P%+
d*	3840 REM Messages	: REM 10
4250 EQUB 0	3850 scannot = FNstring("Scan not	4140 !P% = wr
4260 .trk0 EQUS "Track 0 not found"	met")	: P%=P%+
4270 EQUB 0	3860 scanEQ = FNstring("Scan met	: REM 10
4280 .wrtflt EQUS "Write fault"	equal*)	4150 !P% = se
4290 EQUB 0	3870 scanNE = FNstring("Scan met	: PX=PX+
4300 .secNF EQUS "Sector not found"	not equal")	: REM 11
4310 EQUB 0	3880 unkn = FNstring("Unknown error")	4160 !P% = un
4320 \	3890 clock = FNstring("Clock error")	: P%=P%+
4330 .at EQUS " at "	3900 dma = FNstring("Late DMA")	: REM 11
4340 .trk EQUB 0 \ 2 decimal digits	3910 idCRC = FNstring("ID CRC error")	4170 !P% = un
4350 EQUB 0	3920 dataCRC = FNstring("Data CRC	: P%=P%+
4360 EQUB ASC "/"	error")	: REM 11
4370 .sec EQUB 0	3930 drRdy = FNstring("Drive not	4180 !P% = un
4380 EQUB 0	ready")	: PX=PX+
4390 EQUB &OD \ end msg with newline	3940 wprot = FNstring("Disc write	: REM 11
4400 EQUB 0 \ end of message	protected")	4190 REM
4410 \	3950 trk0 = FNstring("Track 0 not	4200 at = P%
4420 1	found")	: \$P%="
4430 NEXT	3960 wrtflt = FNstring("Write fault")	: P%=P%+
4440 ENDPROC	3970 secNF = FNstring("Sector not	4210 trk = P7
4450 DEF FNintvar(C\$)=(ASC C\$-	found")	: ?P%=0
ASC "@") *4+&400	3980 REM	: P%=P%4
	3990 REM The message table.	: REM 2
	4000 REM completion	4220 ?P% = AS
Linday II	4010 REM type code	: P%=P%+
Listing II	4020 msgtbl=P%	4230 sec = P2
	4030 !P% = scannot	: !P%=&(
930 1	: PX=PX+2	. PY=PY-

	-	
930]	
940	scan =PZ	
	: ?P%=0	
	: P%=P%+1	
950	error =P%	
	: ?P%=0	
	: P%=P%+1	
960	REM	
	fcb =P%	
The same		
990	drive =P%	
	: ?P%=0	
1000	: P%=P%+1	
1000	bufadr=P%	
	1 PZ=PZ+4	
1010		

```
: REM 00 00
4040 !P% = scanEQ
     : P%=P%+2
     : REM 00 01
4050 !P% = scanNE
     : P%=P%+2
     : REM 00 10
4060 !P% = unkn
     : P%=P%+2
     : REM 00 11
4070 !P% = clock
     : P%=P%+2
     : REM 01 00
4080 !P% = dma
     : P%=P%+2
     : REM 01 01
4090 !P% = idCRC
```

1 10 ataCRC +2 1 11 rRdy +2 0 00 prot +2 0 01 rkO +2 0 10 rtflt +2 0 11 ecNF +2 1 00 ınkn +2 1 01 ınkn +2 1 10 ınkn 42 1 11 at " decimal digits ASC "/" 41 k000000 : P%=P%+4 **4240 NEXT** 4250 ENDPROC 4260 DEF FNintvar(C\$)=(ASC C\$-ASC "@")#4+&400 4270 DEF FNstring(S\$) : LOCAL QX 4280 Q%=P% : \$P%=S\$: PX=PX+LEN S\$

This listing is included in this month's cassette tape offer. See order form on Page 165.

4290 ?P%=0

4300 = 0%

: P%=P%+1



: ?P%=0

VES FROM



241 Green Street, Enfield EN3 7SJ

Telephone: 01-804-1378

Unlock your computer, and give it the power to do your donkeywork. How? By employing

A beasty, with up to 4 servos, allows the computer to manipulate a variety of objects – from pushing buttons to controlling the environment in a greenhouse.

We've also come up with a robotic building system which you can use to create the arm shown here. Moments and levers will come to life as you experiment with many different structures.

We can give you computer sight, too. Our revolutionary vision system — SNAP — captures quality moving images which can be displayed on your monitor or printed out. They can also be analysed, processed and enhanced by using the software suite provided.

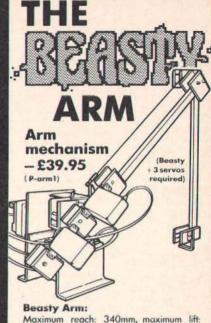
All our products are 'plug in and go', and are available for the BBC Model B. Versions for ORIC, ATMOS, Commodore 64 etc. are presently under development.

And you can start with the whole kit — the beasty, beasty arm and four servos, and the vision system. Or, if you're feeling a little nervous about controlling all this new-found power, your computer can be given its freedom with as little as one beasty and one servo.

So don't waste any more of your valuable time, doing the jobs your computer can handle for you once it's been released. Send for your personal slave right now. ACCESS

Postage and packing £1.25

Your money will be refunded in 14 days if you're not



Maximum reach: 340mm, maximum lift: 400mm, maximum load: 75gms, point to point time: less than 0.5 secs.

SNAP: VISION SYSTEM

Resolution up to 256×128, up to 20 frames/ second, up to 8 grey levels. SNAP-£129.95 (P-Snap1)

SEQUENTIAL SOFTWARE

KERNEL_ONE

an exciting new development for the BBC (32k) micro

–KERNEL_ONE provides –

- Cassette containing fully documented assembler source code for an interrupt driven multi-process scheduler
- Working three process example program
- Comprehensive user guide including principles of professional multi-process systems
- Clear illustration of the full power of the BBC's built-in assembler
- High educational and practical value

Written by a professional software engineer, KERNEL_ONE enables you to learn about MULTI-TASKING systems by building your own multi-process assembler programs in a simple structured way on the BBC microcomputer.

Send Cheque/PO for £12.95 (inc p&p) to:

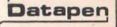
SEQUENTIAL SOFTWARE

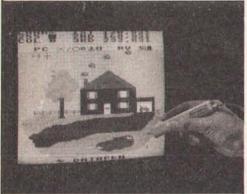
(Dept. M), PO Box 141 Cheltenham, Glos. GL50 4TQ.



Datapen

BBC Lightpen Programs





BEEBPEN DRAWING PROGRAM A comprehensive Mode 2 colour drawing program allowing plot commands, painting, circles, text, character defining, saving and loading to tape or disc, all to be selected and used with the lightpen. PRICE £11.95 Introductory Offer £9.95



TELETEXT DISPLAY CREATOR/EDITOR
Allows the busy programmer to quickly create Mode 7
colour graphics and test screens for combination into
his or her own programs. Movable on screen menu
allows use of complete screen for graphics. Full
instructions and a discussion on teletext features are
provided. PRICE £9.95 Introductory Offer £7.95



BRITAIN
The first in a series of educational Geography and Geology programs. Bittain comes complete with three sets of lests, and these may be very easily changed by adding DATA statements in the Basic program. Full instructions and grid map supplied.
PRICE £6.95 Introductory Offer £5.95

SUPERIOR PROGRAMS Tape storage of your work Good documentation User routines provided on tape and on printout Intensive to ambient lighting Responds to different colours

The Datapen Lightpen itself comes complete with handbook, software on tape including two drawing programs and a printed listing showing useful routines.

PRICE £25.00

Two drawing programs, SKETCH and SHAPE-CREATE are included with the lightpen and the programs shown above may be ordered additionally, or separately as required.

All prices above include VAT, postage and packing.

Please send your cheque/P.O. to:-

Dept. MU2, Datapen Microtechnology Ltd., Kingsclere Road, Overton, Hants. RG25 3JB

lampreadout

Program accessible LED

Switch for program control

: (0) (0 4 = 1/ = ?



Price £6.95 each.





Selected titles available from larger branches of Greens, Rumbelows and all good computer shops or mail order from

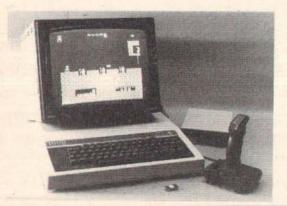
Cases Computer Simulations Ltd., 14 Langton Way, London SE3 7TL.



Strategy Games. They're no pushover.

Microtest Starstick ROM & Joystick Package

Now available the Starstick ROM and Joystick. This comes in three forms:



- (A) The Starstick ROM and Quickshot I Joystick Price 17.95 + VAT = 19.84
- (B) The Starstick ROM and Quickshot II Joystick Price 19.25 + VAT = 22.14
- (C) The Starstick ROM and patch lead, choose your own Spectrum/Atari style joystick Price 15.25 + VAT = 17.54
 Post and Packing £1.00 inc. VAT per item

This enables you to plug the Rapid action self centring joysticks until now only available for the Spectrum/Atari/CBM machines into the user port of the BBC. Model A users please note NO ANALOGUE INTERFACE REQUIRED.

Disc Users Note – pressing BREAK, SHIFT-BREAK or CONTROL BREAK does not modify or destroy the STARSTICK software so Disc Users please feel free to Boot!

The software patch provided in the ROM is interrupt driven and adds the following commands to your computer.

Enables you to use our joysticks even on programs that do not offer joystick capability.

DEALER ENQUIRIES and

EXPORT ORDERS

WELCOME



- STICK turn on the STARSTICK ROM NSTICK turn off the STARSTICK ROM
- SETSTICK turn off the STABSTICK NOW SETSTICK set up joystick to users spec SAVE "NAME" 140 160 saves your user-key protocols ADVAL emulate standard analogue joysticks PAUSE define key to Freeze game "NAME" predefined key protocols set up for software louses programme

- houses programs
 HELP KEYS displays currently selected key protocols
 REPEAT enables auto-repeat fire
 NREPEAT disables auto-repeat fire

available from

MICROTEST LTD

18 Normandy Way, Bodmin, Cornwall PL31 1EX Telephone: 0208 3812

VISA



OR ANY GOOD DEALER
Large picture shows BBC Computer System and a Quickshot II Joystick. Small inset just a few of the joysticks that will work with the patch lead. Screenshot by kind permission of SUPERIOR SOFTWARE



QUALITY EDUCATIONAL SOFTWARE

PI AYROX

BBC MICRO B/ACORN ELECTRON

A series of three programs that will provide hours of fun for all the family

MEMORY is a game for two players, where the computer displays a series of pictures which must be paired off.

HANGMAN has a vocabulary of 280 words and a facility to define your own words. Categories include countries, animals, birds, world capitals and others, for age seven upwards.

BRICKSMASH traps you behind a red brick wall. Answer the general knowledge questions correctly to break down the wall and escape.

All programs are very user-friendly with full colour graphics and high quality sound. All three programs are available on one cassette for £6-50 incl. Also available on 40 Track disc for £8-50.

AVAILABLE BY MAIL ORDER OR FROM GOOD COMPUTER **OUTLETS**

PLEASE STATE WHICH COMPUTER WHEN ORDERING

COMSOFT COMPUTER SOFTWARE 7 ROMAN DRIVE LEEDS WEST YORKSHIRE

GUARANTEED 48 HR DESPATCH

TRADE ENQUIRIES WELCOME, TEL 0532 665621

EPIC ADVENTURES

FULL-SCALE MACHINE CODE ADVENTURES FOR THE BBC AND ELECTRON

OUR AMAZING NEW ADVENTURE IS NOW AVAILABLE

THE WHEEL OF FORTUNE

They said it couldn't be done on the Beeb - but we've done it! The Wheel of Fortune is a classic puzzle adventure, with 250 locations, and brings the following advanced features together for the first time:

- *Sophisticated language and speech interpreters capable of accepting single or multiple commands, up to 254 characters in length. Complex multiple commands are phrased just as ou would speak them
- Moving characters with varying moods. These characters remain active whether you type anything or not. Their reactions to you will depend upon the way in which you have previously treated them. The speech interpreter allows you to talk to them, to either give them commands
- or information, or to ask them questions. Instant half-screen teletext graphics for each location (BBC only). These remain on screen with the text and both may be studied simultaneously. The graphics may be switched on or off, as
- "Up to 10 commonly-used command sentences can be stored and called up as required. The stored sentences may be changed during the game.

 "No frustrating illogical mazes "Humorous character behaviour "Scoring "Fast response "Fully disc compatible "Etc. Etc.

This masterpiece of programming is available for BBC or Electron (state which) for only £9.95

Also available are our 3 popular text adventures. Each has approx. 230 locations and costs just £7.95

1. CASTLE FRANKENSTEIN

2. THE QUEST FOR THE HOLY GRAIL 3. THE KINGDOM OF KLEIN

P&P FREE if ordering 2 or more games, otherwise add 50p

EPIC SOFTWARE

(Dept. B) 10 GLADSTONE STREET, KIBWORTH BEAUCHAMP, LEICESTER LE8 OHL Please make cheques payable to EPIC SOFTWARE All our programs are available for immediate despatch — Dealer enquiries welcome

A SUPER VALUE 12" GREEN SCREEN MONITOR FOR THE BEEB!

12" green screen monitor for only £69.00 – it is fully supported by U-Microcomputers and available through your local dealer. Technical specs: 12" green screen, 90° deflection, composite video input, 15 Use it with Apple, BBC micro or with most of the popular micros

5-1020 U-VIEW 12 green monitor.
Prices exclude VAT & delivery £69.00



U-MICROCOMPUTERS

Warrington, Cheshire WA2 8PR Tel: 0925 54117 Telex 629279 UMICROG

Order from your Dealer now

EPROM PROGRAMMER

A very high quality product direct from the manufacturers, contained in attractive sloping box with low insertion force socket and neon indicator for programming fitted as standard, the software adopts the high efficiency method for programming 2764 and 27128. This allows up to 100% faster programming, software in machine code, supplied on cassette and can be placed in eprom. Very easy to use, menu driven with easy to use instructions. This unit is completely self contained with its own power supply and plugs into the user port.



THIS PROFESSIONAL UNIT ALLOWS:

- 1. Will program: 2716, 2732, 2532, 2764 and 27128 eproms.
- Copy eprom into memory and compute checksum.
- Blank check eprom.
- 4. Program eprom from memory.
- Verify byte by byte and compute checksum.
- allow buffer start area to be changed.
- All operating system calls may be used when in menu mode.
 Semi-intelligent programming. Typical time to program a 2764 8k device is approx. 50 sec. depending on the data to be programmed.
- Additional software supplied to enable your own program (basic or machine code) to be put into eprom with the necessary leader information to allow calling with a *command. Downshift routine to enable basic programs to be run is also supplied.

COST £46.50 please add 15% VAT £1.00 post and package

ORDERS TO:

H.C.R. ELECTRONICS, Industrial Unit, Parker Road, Chelmsford, Essex CM2 0ES.

Access Orders Phone:

Chelmsford (0245) 350188 24 hours



Monitor listing

From Page 51	:BPL 74	,2,ROL,3,0,///,0
Listing I	1. Z5 PLA	230 DATA 1,SEC,0,3,AND,4,0,///
The state of the s	:LDA &2A	,0,0,///,0,0,///,0,3,AND,3 ,3,ROL,3,0,///,0
10 REM Set up data file for Machine	:STA &440 :LDA &2B	240 DATA 1,RTI,11,2,EOR,5,0,///
-code monitor for 6502 ALAN PRICE	STA %441	,0,0,///,0,0,///,0,2,EDR,2
20 REM (C) NICRO USER 1984	:RTS	,2,LSR,2,0,///,0
30 DIM MX 200	100 .Z6 INC &2A	250 DATA 1,PHA,0,2,EOR,1,1,LSR
40 FOR 1X=OTO 2STEP 2	18NE Z7	,7,0,///,0,3,JMP,10,3,EOR,2
:PX=MX	:INC &2B	,3,LSR,2,0,///,0
50 COPT IZ	1. Z7 LDA &2A	260 DATA 2,BVC,8,2,EOR,6,0,///
:STA &407	:CMP &454	,0,0,///,0,0,///,0,2,EOR,3
:STX &406	:LDA &2B	,2,LSR,3,0,///,0
:STY &405	:SBC &455	270 DATA 1,CLI,0,3,EOR,4,0,///
:PLA	1BCS Z5	,0,0,///,0,0,///,0,3,EDR,3
:STA &404	110 PLA	,3,LSR,3,0,///,0
:PLA	:TAX	280 DATA 1,RTS,11,2,ADC,5,0,///
:STA &408	: BCC 23	,0,0,///,0,0,///,0,2,ADC,2
:PLA	11	,2,ROR,2,0,///,0
:STA &409	: NEXT	290 DATA 1,PLA,0,2,ADC,1,1,ROR
:TSX	:CX=M	,7,0,///,0,3,JMP,9,3,ADC,2 ,3,ROR,2,0,///,0
1STX &40A	:7X=2	300 DATA 2,BVS,B,2,ADC,6,0,///
60 JSR &BD52	120 CH=OPENOUT ("MONDAT")	,0,0,///,0,0,///,0,2,ADC,3
1STA &20	:PRINT #CH,CX-MX,ZX-MX,PX-MX :FOR IX=MXTO PX	,2,RDR,3,0,///,0
:STA &A :STA &28	BPUT SCH,?IX	310 DATA 1,SEI,0,3,ADC,4,0,///
:DEC &28	:NEXT	,0,0,///,0,0,///,0,3,ADC,3
:LDA #&7E	130 FOR 1X=0TO 255	,3,ROR,3,0,///,0
:JSR &FFF4	:READ JZ	320 DATA 0,///,0,2,STA,5,0,///
:LDA &16	:BPUT #CH,JX	,0,0,///,0,2,STY,2,2,STA,2
:STA &B	:READ A\$,2,STX,2,0,///,0
:LDA &17	:FOR JX=1TO 3	330 DATA 1,DEY,0,0,///,0,1,TXA
ISTA &C	:BPUT @CH,ASC (MID\$(A\$,J%,1))	,0,0,///,0,3,STY,2,3,STA,2
:JMP &BAE1	:NEXT	,3,STX,2,0,///,0
70 .M LDX &40A	:READ JZ	340 DATA 2,BCC,8,2,STA,6,0,///
:TXS	:BPUT OCH,J%	,0,0,///,0,2,STY,3,2,STA,3
sLDA &404	:NEXT	,2,STX,4,0,///,0
€PHA	140 CLOSE #CH	350 DATA 1,TYA,0,3,STA,4,1,TXS
:LDA &407	: END	,0,0,///,0,0,///,0,3,5TA,3 ,0,///,0,0,///,0
:LDX &406	150 REM DATA for each instruction.	360 DATA 2,LDY,1,2,LDA,5,2,LDX
:LDY &405	160 DATA 1,BRK,0,2,0RA,5,0,///	,1,0,///,0,2,LDY,2,2,LDA,2
:PLP	,0,0,///,0,0,///,0,2,DRA,2 ,2,ASL,2,0,///,0	,2,LDX,2,0,///,0
:JMP(&408) 80 .Z LDX \$3	170 DATA 1,PHP,0,2,ORA,1,1,ASL	370 DATA 1, TAY, 0, 2, LDA, 1, 1, TAX
:.Z1 LDA &45C,X	,7,0,///,0,0,///,0,3,0RA,2	,0,0,///,0,3,LDY,2,3,LDA,2
IBNE Z2	,3,ASL,2,0,///,0	,3,LDX,2,0,///,0
:DEX	180 DATA 2,BPL,8,2,QRA,6,0,///	380 DATA 2,BCS,8,2,LDA,6,0,///
BNE Z1	,0,0,///,0,0,///,0,2,0RA,3	,0,0,///,0,2,LDY,3,2,LDA,3
1.22 LDA &440	,2,ASL,3,0,///,0	,2,LDX,4,0,///,0
:STA &2A	190 DATA 1,CLC,0,3,ORA,4,0,///	390 DATA 1,CLV,0,3,LDA,4,1,TSX
:LDA &441	,0,0,///,0,0,///,0,3,ORA,3	,0,0,///,0,3,LDY,3,3,LDA,3
:STA &2B	,3,ASL,3,0,///,0	,3,LDX,4,0,///,0
:TXA	200 DATA 3,JSR,12,2,AND,5,0,///	400 DATA 2,CPY,1,2,CMP,5,0,///
90 . Z3 PHA	,0,0,///,0,2,BIT,2,2,AND,2	,0,0,///,0,2,CPY,2,2,CMP,2
:LDY #0	,2,ROL,2,0,///,0	,2,DEC,2,0,///,0
:.Z4 LDA (&2A),Y	210 DATA 1,PLP,0,2,AND,1,1,RDL	410 DATA 1, INY, 0, 2, CMP, 1, 1, DEX
:CMP &45C,X	,7,0,///,0,3,BIT,2,3,AND,2	,0,0,///,0,3,CPY,2,3,CMP,2
:BNE Z6	,3,ROL,2,0,///,0	,3,DEC,2,0,///,0
INY	220 DATA 2,BMI,8,2,AMD,5,0,///	420 DATA 2,BNE,B,2,CMP,6,0,///
:DEX	,0,0,///,0,0,///,0,2,AND,3	

Monitor listing

From Page 153	:?&203=MXDIV 256	370 PRINT "L,M,T update PC. Press
,0,0,///,0,0,///,0,2,CMP,3	:*FX229,1	any key to stop."
,2,DEC,3,0,///,0	130 BZ=&FF0002+PX	380 PRINT "A,X,Y,F are aborted uncha
430 DATA 1,CLD,0,3,CMP,4,0,///	: 07=&1FF	nged by Esc"
,0,0,///,0,0,///,0,3,CMP,3	:60SUB 190	PRINT
,3,DEC,3,0,///,0	:CALL CX	390 PRINT " PC A X Y F Flags
440 DATA 2,CPX,1,2,SBC,5,0,///	140 ON ERROR OFF	Instruction*
,0,0,///,0,2,CPX,2,2,SBC,2	:*FX229,0	:60SUB 960
	150 END	400 YZ=INKEY (1)
,2,INC,2,0,///,0 450 DATA 1,INX,0,2,SBC,1,1,NDP	160 P%=(B%AND &FFFF)-2	410 HX=0
	:QX=((BXDIV &10000)AND &FF)+	
,0,0,///,0,3,CPX,2,3,SBC,2	:60SUB 740	THEN 140
,3,INC,2,0,///,0	:IF H%(0	
460 DATA 2,BEQ,8,2,SBC,6,0,///	THEN 520	ELSE IF (Y%>64) AND (Y%(91)
,0,0,///,0,0,///,0,2,SBC,3	170 GOSUB 960	THEN ON (YX-64) GOTO 470 ,570
,2,INC,3,0,///,0	:YZ=INKEY (1)	,680 ,660 ,460 ,500 ,450 ,190
470 DATA 1,SED,0,3,SBC,4,0,///	:IF (YX(0)AND ?PXAND (HX=0)	,390 ,390 ,630 ,640 ,390
,0,0,///,0,0,///,0,3,SBC,3	THEN 540	,390 ,440 ,140 ,520 ,530 ,540
,3,1NC,3,0,///,0		,560 ,700 ,610 ,480 ,490 ,720
Listing II	ELSE 410	420 IF (YX=13)
Listing II	180 REM ***********************************	***** THEN PX=SX
10 REM Machine-code monitor for	****	:60SUB 960
6502 ALAN PRICE	190 PRINT	
20 REM (C) MICRO USER 1984	:PRINT	ELSE IF (YZ=44) OR (YZ=60)
30 LOMEM =TD P	:PRINT " Machine-coo	
:DIN DZ1280	Monitor*	:6DSUB 960
:DIM EZ48	200 PRINT * **********************************	
:KZ=OPENIN ("MONDAT")		ELSE IF (Y%=46)OR (Y%=62)
: INPUT #KX,CX,ZX,PX	210 PRINT "A,X,Y,F Set A,X,Y,F1	
:DIM MX PX	registers"	:60SUB 960
40 CZ=MZ+CZ	220 PRINT "P Set Program of	
: ZX=MX+ZX	er (PC)"	ELSE IF YX>0
:P%=M%+P%	230 PRINT "B,C,D Set,Clear,Dis	
FOR IX=MXTO PX	breakpoints"	430 BOTO 400
:?1%=B6ET #K%	240 PRINT "E Reset PC to	
:NEXT	value on Entry*	1PX=XX
50 FDR 1%=0TD 1279	250 PRINT "6 Get stack poi	
:?(DX+1X)=BGET #KX	to PC"	IREN P
:NEXT	260 PRINT "L List as instr	
:CLOSE OKZ	ons from PC"	
60 LOMEM =PX		:60TO 390
:FOR IX=EXTO EX+44STEP 4	270 PRINT "M Display Memor	
:!1%=0	from PC"	460 PX=(BXAND &FFFF)-2
:NEXT	280 PRINT "W Write to mean	
70 ?2=LDMEN HOD 256	at PC, PC=PC+1"	IREM E
	290 PRINT * Repeat until	470 JX=8407
:73=LOMEM DIV 256	Esc."	:80T0 510
80 PX=0	300 PRINT "R,S,T Run,Single-sh	
:AX=0	race from PC*	480 JX=\$406
:0%=3	310 PRINT "U Set upper lie	
:UX=&8000	for S,T,Z"	:REM X
:WZ=0	320 PRINT "H Displays this	
90 REM ***********************************	text"	:BOTD 510
******	330 PRINT "Q,Esc Quit- resets	:REM Y
100 REM Restart Monitor. Previous	BASIC break action"	500 JX=&404
values are preserved, except	340 PRINT "V VDU value, e.	g. :REM F
for Stack Pointer which is	select printer*	510 GOSUB 860
reset.	350 PRINT "Z Search for he	x : IF 1%=27
110 ON ERROR BOSUB 160	bytes from PC-U"	THEN 400
:CALL C%	360 PRINT "<>RETURN Previous/nex	t ELSE ?J%=X%
120 ?&202=H%MOD 256	byte, next instruction*	Turn to Page 157

MICROTEST LTD

18 Normandy Way, Bodmin, Cornwall PL31 1EX. Telephone: 0208 3812

AUTHORISED DEALERS & REPAIRERS FOR THE BBC COMPUTER, ACORN COMPUTERS, TORCH COMPUTERS, COMMODORE COMPUTERS & MANY OTHERS.

Dept. of Industry Approved Econet Centre.

ELECTRONS NOW IN STOCK

SLIMLINE DISC DRIVES	HARDWARE	
Teac FD55A (100k, 40tk) £195	BBC Model B£399)
FD55E (200k, 80tk) £230	BBC Model A£299	•
FD55F (400k, 80tk, d/s) £290	Electron £199	9
TEC FB501 (100k, 40tk) £195	Teletext Adaptor£225	5
TEC FB502 (200k, 80tk) £230	Disc I/F£90	
TEC FB504 (400k, 80tk,	Fronet I/F £70	1
d/s)£290	Econet I/F	i
Cumana CD400S (2x200k	A to B upgrade£90	i
+ PSU) £460	Romex ROM Board£45	5
Cumana CD800S (2x400K + PSU)	Solidisk Sideways RAM P.O.A	
£550	All upgrades fitted free.	-
Above prices include all leads, utilit		
MONITORS	PRINTERS	
Sanyo DM8112CX (25MHz)£115	Juki Daisywheel£45	0
(25MHz) €115	Sanplé£33	2
Sanyo DM8112 (18MHz) £80	CP80£23	
Nordmende 1434 (14") £249	Star Gemini 10X£25	2
Microvitec Cob 1431 (14") £280	Epson RX80£30	
JVC Med. Res. (14") £230	Epson FX80 £39	5
Cabel 14"£225	New Epson RX80FT £310	ŏ
	Computer/printer leads	
	for above£1:	2
I ama antiquasa natastian	from hundreds of titles	

Large software selection from hundreds of title

Now open - Educational section.
VAT - P&P £9 on large items, 50p on software and All prices include VAT interface kits.

Export orders welcome

For the best - phone MICROTEST 0208 3812

******	+
*SOFTWARE RICKSOFT	4
*for the	*
	*
*BBC MICRO	*
★ * Arcade Games * Adventures * ★ * Educational * Utilities *	*
* Languages * and more	*
Most from £1 per fortnight	TA TA
★ WITH OPTION TO With up to	* *
25% discount Plus "Buy Only" section	*
★ Membership £10	*
★ For catalogue and membership form send name ★ and address to	*
Ricksoft, Dept. B 78, Warren Drive, Hornchurch,	*
Essex RM12 4QX. Tel: (04024) 47722	*
******	*

Expandable console for the **BBC** Micro

As supplied to Universities, Colleges, Schools, Business and Home Users.

Not just a monitor/tv stand but an expansion console which gives your micro the professional look. Protects and encloses your micro with room for disc drives and 2nd. processor or teletext adapter etc., all untidy connecting wires safely out of sight within the console. Made of light yet strong aluminium with a textured finish in matching BBC colour. Available now a bolt on extra module to the console for further expansion options. YES this console will grow with your needs. Basic BBC console as shown £44.99 + £4 carriage

After 31st March - console price is £44.99 Bolt on expansion module

£14.99 + £2 p&p

SPECIAL TORCH MODEL AVAILABLE: £46.99



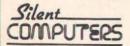
Matching Printer Stand, can double for VDU Stand over the micro only £14.99 + £2 carriage

ELECTRON CONSOLE

The console will house the ELECTRON and will safely support the expansion interfaces which will plug into the rear of the micro and will support the VDU at eye level. Tidies up all wiring between the micro, cassette and VDU. The console stores the cassette and tapes and will allow space for drives at a later date.

Electron console as shown £34.99 + £3 p&p

Mail order only - viewing by appointment Please add 15% VAT For further information or send cheque to:



27 WYCOMBE ROAD, LONDON N17 9XN. TEL: 01-801 3014 (24 Hr Ansaphone)

WANTED!

Got a good program? Come to the experts

We are looking for original software titles for National and International Distribution for the following Machines:

Any Atari Home Computer Sinclair Spectrum/QL BBC 'B'/Acorn Electron Commodore '64

We are also interested to hear from capable freelance programmers.

Please contact in writing only:

Jon Dean Software Acquisition Centre Atari International (UK) Inc., (MU) Atari House, Railway Terrace Slough, Berks, SL2 5LS



2 NEW BUSINESS SOFTWARE PROGRAMS

€49.95

HUGE STORAGE CAPACITY UP TO 1600/3200 FULL ENTRIES

FAST WRITE AND READ CAPABILITY

EASY UPDATES AND AMENDMENTS WITH COMPREHENSIVE MENU

FULLY AUTOMATIC ALPHA-SORTING

VERY USER FRIENDLY

FULL COLOUR GRAPHICS UTILISED

EASY TO FOLLOW USER GUIDE MANUAL

DISK ONLY O PRICES INCLUDE VAT & DELIVERY BY REGISTERED MAIL WITHIN 10 DAYS EITHER PROGRAM (49.95 O BOTH TOGETHER (90.0) STATE SINGLE OR DOUBLE DRIVE: 40/80 TRACK CHEQUE / P.O. PAYABLE TO MLC COMPUTERS LTD @ FULLY GUARANTEED

DEALER ENQUIRIES WELCOME

PEAR TREE MEADOW € ELLINGTON THORPE € HUNTINGDON € CAMBS 20480-891141/811573

!!! NEW NEW NEW !!!

LARGE STOCKS AVAILABLE

ANTI-AIRCRAFT GUN fh SIMULATOR

For 32k BBC Micro

An Exhilarating New Game from Software Division

- 100% Machine Code Hi-Speed Graphics
- Three Winning Score Levels
- Sound on/off Option
- Long Range Radar Screen
- 'Moving' Screen feature Realistic Blast Effect
- Joystick or Keyboard

THE ENEMY CONSISTS OF:

- Helicopters
- Jet Fighter Planes
- Paratroop Planes
- Paratroops
- Rocket Bombs



SCREEN DIAGRAM

You are sitting at the controls of the gun turret. You view the scenery via a camera on the gun barrel. Suddenly a blip appears on the radar. You swing the gun around to meet the blip - the scenery flashes by - the enemy plane bursts onto the large video screen, he is in the sights, squeeze the trigger—bullets scream out—the explosion is devastating. Your smile fades as two blips appear on the radar

Soon to be available for Electron

All PO orders sent by return. Cheques 7 days.



7 OBRIDGE ROAD, TAUNTON, SOMERSET TA2 7PX

WARNING

Prolonged exposure to this program may result in severe addiction!!

M-TEC=

AT LAST! BBCBASIC to run on YOUR CP/M Computer

BBCBASIC(Z80

Now available for the TORCH and DISKPACK with full GRAPHICS

WHY STRUGGLE ON using OLD FASHIONED BASICs when you can have ALL THE ADVANTAGES OF BBCBASIC(Z80) on your computer?

Of course, we can't turn your computer's video display into a high resolution colour monitor, but we can give you all the other features of BBCBASIC including:

>LONG VARIABLE NAMES

- >MULTI-LINE REPEAT UNTIL STATEMENTS
 >MULTI-LINE NAMED FUNCTIONS
- >MULTI-LINE NAMED PROCEDURES
- >POWERFUL DIRECT MEMORY MANIPULATION USING THE INDIRECTION OPERATORS
- >AN IN-LINE ASSEMBLER USING STANDARD Z80 MNEMONICS
- >VERY SOPHISTICATED PARAMETER PASSING IN THE CALL STATEMENT
- >SERIAL RANDOM AND INDEXED DISK FILES PLUS THE ABILITY TO ACCESS ANY BYTE IN THE FILE
- >CLEAR SCREEN, TAB(X), TAB(X,Y), POS, VPOS and TIME Plus ALL THE OTHER STANDARD COMMANDS etc.

You can copy any program written in older standard versions of BASIC with little change OR you can write well-structured and easy to read programs like a professional.

You need never say GOTO again. But we won't stop you.

Price, including postage, £95 + VAT

TORCH version including SOUND and GRAPHICS £110 + VAT BBCBASIC(Z80) will run on any computer using CP/M 2.2 or later and a Z80 processor. It comes complete with an instruction manual, a tutor on file handling and configuration notes.

Trade enquiries welcome

M-TEC Computer Services (UK), Ollands Road, Reepham, Norfolk

Telephone Norwich 870620

Prestel Mailbox Nos. 603870620

MUSIC SPECIALISTS FOR THE 32K BBC MICRO * THE SYNTH * (O.S. 1.0+)

flexible and inventive program that's highly recommendable." (Dr David

Ellis, E&MM, Oct 83)
This 'synthesizer' program has features which to our knowledge are unique.

* ALTER RHYTHM. The rhythm of a recorded melody may be altered by tapping

on a single key.

* REPEAT. No need to play a phrase twice, great saving in space.

* REAL TIME PLAYING. With alteration of volume, envelope and octave pitch as

This is the program for the experimenter who wants to make HUMAN music rather than perform mathematical finger dexterity exercises.
 THE SYNTH. Cassette & instructions only £8.75 inc. P&P.

* KEYBOARDS * (0.S. 1.0+)

5 programs to turn your BBC into 5 real-time keyboards. 1.3 simultaneous voices (in Basic for easy understanding) 2. Single voice M/C with Pitch Bend. 3.3 simultaneous voice M/C with Envelope control built in. 4. Single finger Chord organ ranging over the whole keyboard, 2 variations for each chord. 5. Chord organ 2 with different chord configuration. These are all separate programs designed for you to use as they are or in your own programs. are or in your own programs.
KEYBOARDS cassette & instructions £5.75 inc P&P

* MUSICTOOLS * (all O.S.)

"Musicsoft also produce an excellent "Musictools 1" cassette good value" (E&MM, Oct 83) Five music utility programs on one tape.

Tune Generator with dynamic graphic Keyboard & Stave display, Envelope Command Explorer (Very easy to use), Musical Symbols Graphic routine, Simple single line organ with sophisticated controls. Over 60 procedures for you to use in your programs already in working programs.

MUSICTOOLS 1 cassette & instructions £5.75 inc. P&P

**PIEMAN ** (all O.S.)

"The best version of Simon I've seen, it goes so much further than most" (Quote by a rival software firm!) Recommended for Primary & Middle Schools. Not as simple as Simon! It develops into a fun set of ear cleaning and musical concentration games – from easy at infant level to impossible at graduation!

Auto scoring.
PIEMAN cassette & instructions £5.75 inc. P&P.

ALL PROGRAMS TRANSFER EASILY TO DISC. Cheques and official orders to: MUSICSOFT, 12 Fallowfield, Ampthill, Beds. Telephone: 0525 402701

If you require further information, please send S.A.E.

Monitor listing

: IX=IX-1 :INTI (IX<=0) DR (INKEY (1)>0)	:REM Z 740 FOR IX=FXTO SXSTEP 4
:60TD 400	: 12=:12
	:IF XX
	THEN ?(XZAND &FFFF)=(XZDIV &1000
	O) AND &FF
	750 NEXT
	RETURN
	760 FOR 1%=F%TO G%STEP 4
	: XX=! IX
	:IF XX
	THEN ?(IZ+2)=?(XZAND &FFFF)
	:?(XZAND &FFFF)=0
	770 NEXT
	RETURN
	780 JX=-1
	FOR IZ=FZTO SZSTEP 4
	:YX=!IXAND &FFFF
	:IF YX
:PX=PX+8	THEN IF YZ=XZ
	THEN JZ=1Z
:UNTIL (XX(=0) DR (INKEY (1)>0)	790 NEXT
:60TO 390	: RETURN
:REN N	800 K%=135
660 PRINT "Breakpoints:"	11F Y%>127
: 0%=5	THEN YX=YX-128
:F1=E1+8	
	: KZ=KZ-4
	810 IF YX<32
	THEN KX=KX-2
	: YZ=YZ+64
	820 IF YZ=32
	THEN KX=KX+16
	: YZ=47
	830 IF YX=&7F
	THEN KZ=KZ+16
	:YX=115
	840 IF 0%=2
	THEN KX=32+ABS (KX-135)
	850 VDU KX
	:PRINT CHR\$ (Y%);
	: RETURN
THEN !J%=0	860 XX=0
	870 VDU 3
ELSE PRINT "Not in breakpoint	:PRINT TAB(O, VPOS);
list."	:VDU YX,63
690 60TD 390	:PRINT ; ~XZ;
:REN C	The contract of the contract o
700 GOSUB 860	:VDU 32,32,32,8,8,8 :REPEAT
:IF (XX=2)OR (XX=3)	
	:IX=INKEY (1)
	:UNTIL IZ>0
	880 IF IX=127
	THEN XX=XXDIV 16
	:60TO 870
	890 IF (1%)=48)AND (1%<58)
	THEN XX=16*XX+1X-48
	:60TO 870
	900 IF (12>64) AND (12(71)
770 04-94	
730 WX=XX :CALL ZX	THEN XX=16+XX+1X-55
	:UNTIL (1X<=0)OR (INKEY (1)>0) :GOTO 400 :REM L 640 GOSUB 860 :REPEAT :eX=4 :PRINT "PX; :VDU 32 :eX=2 :FOR JX=PXTO PX+7 :PRINT ";JX; :NEXT :VDU 32,32 :FOR JX=PXTO PX+7 :YX=?JX :GOSUB 800 650 NEXT :PRINT :PX=PX+8 :XX=XZ-8 :UNTIL (XX<=0)OR (INKEY (1)>0) :GOTO 390 :REM M 660 PRINT "Breakpoints:" :eX=5 :FX=EX+8 :SX=EX+44 :FOR IX=FXTO GXSTEP 4 :YZ=!IXAND &FFFF :IF YX THEN PRINT "YX; 670 NEXT :PRINT :GOTO 390 :REM D 680 GOSUB 860 :FX=EX+8 :GX=EX+44 :GOSUB 780 :IF JX>0 THEN !JX=0 : ELSE PRINT "Not in breakpoint list." 690 GOTO 390 :REM C

Monitor listing

From Page 157	ELSE IF XX=0	1220 PRINT "(&"; "VX; ", X)"; :RETURN
:60TD 870	THEN HX=1	1230 REM
910 IF (IX(>13)AND (IX(>27)	1020 PRINT SPC (22-POS);	
THEN 870	:XX=32	1240 REM Mode 6. Indirect indexed.
920 PRINT TAB(O, VPOS);	:FOR YX=DX+5*LX+1TO DX+5*LX+4	1-byte value is the address
:IF 0%=2	:VDU XX	of a 2-byte
THEN VDU 2, YZ, 63	: XX=?YX	1250 REM value in page 0 which is
:PRINT ; "XX;	:NEXT	added to the value of the
930 PRINT	:VDU 32	Y-register for the
RETURN	:!EX=SX	1260 REM address of the operand.
940 REPEAT	:! (EX+4)=0	1270 PRINT "(&"; "V%; "), Y";
:XX=INKEY (1)	1030 IF XX	: RETURN
:UNTIL XX(0	THEN DN XX60SUB 1080 ,1110	1280 REM
RETURN	,1140 ,1170 ,1220 ,1270 ,1300	
950 RETURN	,1340 ,1380 ,1410 ,1440 ,1470	1290 REM Operand is the value of
960 IF PI>&FFFFPI=0	1040 IF ((!EX>=UX)OR (!(EX+4)>=UX))	A-register.
ELSE IF PX(OPX=&FFFF	AND (HZ>=0)	1300 PRINT "A";
970 PRINT TAB(0, VPOS);	THEN VDU 32,104*0%-176,85	:RETURN
: 0%=4	:H%=1	1310 REM
PRINT "PZ;	1050 PRINT	
:IF HX<0	RETURN	1320 REM Mode 8. 1-byte signed value
THEN 1000	1060 REM	(-128/+127) is added to the
980 ex=9	1080 REN	address
PRINT "AZ;	1070 REM Mode 1. Immediate mode	1330 REM of the NEXT instruction.
		1340 XX=SX+VX-2*(VXAND &80)
:VDU 32 :SX=&80	, 1-byte value is operand of the instruction.	:PRINT "&";~XX;
:FOR J%=1TO 8	1080 PRINT "#&"; "VX;	:!(EX+4)=XX
:IF (SXAND AX)	RETURN	:RETURN
THEN PRINT MID\$("NVDIZC"	1090 REM	1350 REM
	1090 KER	
,J%,1);		1360 REM Mode 9. Indirect jump.
CI CC DOINT	1100 REM Mode 2. Page 0 (2-byte)	2-byte value is the address
ELSE PRINT ".";	, absolute (3-byte) address	of a store location
990 SX=SXDIV 2	of operand.	1370 REM which holds the operand.
:NEXT 1000 S%=P%	1110 PRINT "&"; ~VZ;	1380 !EX=!VXAND &FFFF
The state of the s	: RETURN	:PRINT "(&";~VZ;")";
;J%=0	1120 REM	:RETURN
:REPEAT	1170 DEM Made 7 Dans 0 (2 buts)	1390 REM
:KX=?SX	1130 REM Mode 3. Page 0 (2-byte)	
:SX=SX+1	, absolute (3-byte) address	1400 REM Mode 10. JMP
:IF JX=0	modified by X-reg.	1410 !EX=VX
THEN LX=KX	1140 PRINT "&"; "VX; ", X";	:PRINT "&"; "V%;
: XX=?(DX+5+LX)	RETURN	:RETURN
ELSE IF JX=1	1150 REM	1420 REM
THEN VX=KX		
ELSE V%=256*K%+V%	1160 REM Mode 4. 3-byte instruction	1430 REM Mode 11, RTS,RTI.
1010 JX=JX+1	, absolute address modified	1440 !EX=(!(QX+1)AND &FFFF)+1
:UNTIL JX>=XX	by Y-register.	RETURN
:IF HX(0	1170 PRINT "&"; "VX; ", Y";	1450 REM
THEN 0X=3	:RETURN	
:FOR XX=0TO JX-1	1180 REM	1460 REM Mode 12. JSR
:PRINT ~?(SZ-JZ+XZ);		1470 IF VX(UX
INEXT	1190 REM Mode 5. Indexed indirect.	THEN !EX=VX
:PRINT SPC (14-POS);	1-byte value is added to the	1480 PRINT "&"; "VX;
:FOR XX=0T0 JX-1	contents of the	RETURN S
:Y%=?(S%-J%+%%)	1200 REM X-register. Result is the	
:60SUB 800	address of a page 0 location	This listing is included in this
:NEXT	which holds the	month's cassette tape offer. See
:VDU 103+0%-174	1210 REM address of the operand.	order form on Page 165.

1210 REM address of the operand.

:VDU 103+0%-174

DISC DRIVES FOR THE BBC MICRO

Full height 40 track Disc Drives cased and cabled for £100

Single System	Dual Systen
£	£
140	270
176	340
200	390
	£ 140 176

Integral PSU £40 extra.

Price includes case, cables, carriage & VAT

Disc Inter	faces	Single double		£98 £109
DFS only		double		£98
EPROMS	2764 Add	£9.20 £1 P&P	27128 to above	£25.30
		DISKET	TES	
		Wabash	Datalife	e Verex

	Wabash	Datalife	Verex
40 track ss sd	16.10		16.10
40 track ss dd		19.55	_
40 track ds dd	20.12	27.60	
80 track ds dd	26.45	32.20	
Son	v 31" Disc	ettes £40	

Add £1 P&P for 3 boxes 4 or more post free

LOCKABLE STORAGE CASES

To hold 40 diskettes £15 To hold 80 diskettes £20 Add £2 P&P per box

ALL PRICES INCLUDE VAT

Dealer enquiries invited CARSON DEVELOPMENTS (MU)

84 Highfield Road, Romford, Essex, RM5 3RU.

Telephone: 0708 27043



XTEND: EPROM UTILITY WITH OPTIONAL PROTECTION SYSTEM:

£24.95. Extend capabilities of your micro with new commands. Invaluable to serious programmer: "FIND.COUNT.REPLACE: any string combination replaced (Globally or Selectively) with user specified string (any length). "CONDENSE: Intelligently and selectively removes REMs. comments, spaces, compacts lines into multi-statement lines. Removes empty lines. *APPEND: joins code simply. *KEYS: Display and edit function keys. *MEM: memory summary with variables taken into account. "STEP: much enhanced trace. Step through line by line at own pace. Numbers shown discreetly at top. Twin screens to protect graphics. Stop and interrogate variables any time. *LIST: left justification of all statements. *VAR: dump variable contents, FN and PROC locations. *SINGLE generate 'single key' keywords — similar to Electron. *FIX: recovers 'BAD PROGRAM's.

Calls may be prefixed with 'X' to avoid clashes with other ROMs.

PROTECTION SYSTEM (OPTIONAL) £7.95. Name and address (please print clearly) incorporated in XTEND. Displayed on screen on power-up.

DATABASE: £12.95. Make card-filing obsolete. Cassette/disc (32K): "Variable field length. "Fast sort/search any field. "Search and replace. "Specific, between-range, wildcard search. *Ammend, delete, replace.

Use as mailing list, school/class/club/business records, directories, inventories, catalogues, teaching resource where data compilation and classification are required

EEL: £7.95 Fun way to learn number bonds/tables. Guide eel and eat the number family. 20 levels of difficulty, suitable for 6+ year olds. User performance record for teacher/parent. WORDSQUARE: £7.95 Create wordsquares for any topic.

G.B. GEOGRAPHY: £7.95 High Res. maps of regions.

EURO-GEOGRAPHY: £7.95 High Res. Test your knowledge of countries and capital

MEASURE I: £7.95 Simulations of measurement in maths, capacity, temperature, volume. MEASURE II: £7.95 Relationships in balance

GEMINI BUSINESS SOFTWARE: £17.95 HOME ACCOUNTS - MAILIST - STOCK CONTROL - SPREADSHEET - GRAPHPLOT - COMMERCIAL ACCOUNTS.

MICRO CASE: £35.00 +£3.00 p&p Strong, foam-lined, lockable. Holds BBC micro. recorder, disc drive, cassettes, cables. Black with aluminium trim.

EPROM BLASTING SERVICE Forget cassettes. Put your favourite program in a chip. Phone for details.

Cheque, Access/Visa (Phone anytime), Official order to:

PRIMASOFT.

FREEPOST, GLOSSOP, DERBYSHIRE SK13 9YB.

Add £3.00 per program for disc version. 50 p&p Excellent royalties for quality Educational software DEALER ENQUIRIES WELCOME TEL: GLOSSOP 62743

Disc Drive Multiplexer

- * NO SWITCHES
- * NO SOFTWARE
- * NO EXTRA CABLES OR CONNECTORS

This is the simple low cost alternative to buying disc drives for every BBC. This unit allows the connection of up to 4 BBC Computers to the same disc drives. The operation is total automatic because it uses one of the disc interface outputs to electronically switch between computers. The computer will simply wait for access to the drives if they are in use. All the DFs commands are used as normal. It is ideal for use in schools and offices and saves having to purchase 1, 2 or 3 dual drive for about £500 each. The unit is complete with its own power supply.

£ 75.00 + VAT for dual unit Prices: £135.00 + VAT for quad unit

BBC Interface Design Service

We now offer a complete design service for interfacing the BBC Computer to external equipment, e.g. analogue and digital multiplexing, motor control, and even complete experiments.

We will be pleased to quote for the complete hardware and software design and manufacture for your system. For further details contact:

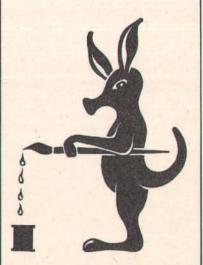
Benwick Electronics

9 Doddington Road, Benwick, Nr. March, Cambs. PE15 OUX.

Tel: Benwick (035477) 471

Frak!

- - - from better Dealers everywhere



Aardvark's aartful graphics game on the Beeb.

Aardvark Software, 100 Ardleigh Green Road, Hornchurch, Essex RM11 2LG What they say about Squirrel
Software's games for the BBC 'B' and
ELECTRON

TRAFALGAR

"Best of its type"

"Totally original new game"

"A game you will really enjoy for a long time"

Software Supermarket.

SUPERGOL

£7.50

"Well conceived and well worth playing – Supergolf remains fun and left me wanting to play again – enough said?"

The Micro User

" - Like the real thing" A+B Computing

BUNFUN

£6.50

"It's a game that will drive you mad – but you won't mind"

The Micro User

" - Should appeal with its humour and brash presentation to the younger BBC user"

A+B Computing

Available from John Menzies and all leading software shops, or by mail-order from:

SQUIRRELSOFTWARE

Dent B.

4 BINDLOSS AVENUE, ECCLES, MANCHESTER M30

24 Hour answering service - 061-789 4120

Cheques, P.O.s



Programs required good royalties paid

HORNBY SOFTWARE

Britain's top
Spectrum Pro-Golf Series now available for the first time on BBC Model B 1.2 O.S.

The real thing, exact simulation of Britain's top golf courses.

1. All golf rules apply.

- 2. Designed for one or two players.
- 3. Played off any handicap.
- 4. On each hole, distance, par, green enlargement.
- Control shot choice of all clubs, strength, direction.
- 6. Graphics excellent.
- 7. Extremely realistic.

TROON £7.75 NEWBIRKDALE £7.75
WENTWORTH EAST & WEST COURSE £11.00

All prices include VAT & P&P

Available from:

HORNBY SOFTWARE
21 Pinfold Hill, Leeds LS15 0PW.
Telephone: 0937 65847

4 Emmanuel St.

Our *new* Personal
Computer Centre
specializing in
the BBC Micro
with complete support

we know computers

Business & Professional Tel: 0223 65335/4



Educational

Cambridge Computer Store

1&4 Emmanuel Street, Cambridge

LEAP AHEAD!

You've been asking us to produce an EARLY READING program—NOW WE HAVE!

WORDS & PICTURES

-features all the words used in early reading books

- is already a best seller in schools

—will be bought by concerned parents (suits children 3-7 years)

-words can be practised alone or in sentences

 sing-along sequence: complete words and animation to the popular rhyme 'Five Little Speckled Frogs'

Available now for the BBC 32K on DISC and CASSETTE.

Available shortly for the Spectum 48K and Commodore 64.



£9.95 (retail) Good discounts given

Comes in a deluxe A5 plastic package with full colour wrapper and comprehensive booklet inside.

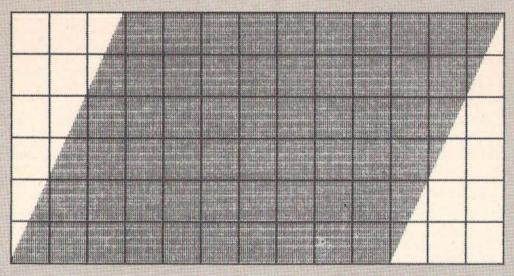
CHALKSOFT LTD 37 Willowslea Road WORCESTER WR3 7QP Tel: 0905 55192

Dealers may order direct or through SOFTSEL, LIGHTNING, and WEBSTERS software.

Members of The Computer Trade Association.



Maths listing



Area of parallelogram = height base Area of parallelogram = 6 Haven't you learnt your tables yet

From Page 103

10 REM AREAS

20 REM JOHN LORD

30 REM (c) MICRO USER 1984

40 REM PRINTS RANDOM RECTANGLES

50 REM PARALLELDGRAMS &TRIANGLES

60 REM MAKES THE USER INPUT THE

70 REM BASE, HEIGHT AND AREA OF

80 REM THE SHAPE.

90 v0=350

:x0=100

:inc=80

100 *KEY10 OLD!M RUN!M

110 ON ERROR GOTO 120

120 MODE 7

130 PROCOptions

140 MODE 1

150 GCOL 0,2

:GCOL 0.129

160 VDU 24,90;340;1150;1000;

170 ON Y GOTO 190 ,290 ,390

180

190 REM RECTANGLES

200

210 REPEAT

220 GCOL 0,128

:CLG

:6COL 0.129

230 XX=3+RND(7)

: Y%=3+RND(5)

:07=0

:F=1

:A\$="rectangle ="

:A1\$=""

240 PROCparallel

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are in the July 1983 issue of The Micro User.

250 PROCdrawgrid

260 PROCtext

270 UNTIL FALSE

280

290 REM PARALLELOGRAMS

300

310 REPEAT

320 GCOL 0,128

:CL6

:GCOL 0.129

330 XZ=3+RND(7)

: YX=3+RND(5)

:0%=RND(3)

:F=1

:A\$="parallelogram ="

:A1\$=""

340 PROCparallel

350 PROCdraworid

360 PROCtext

370 UNTIL FALSE 380

390 REM TRIANGLES

400

410 REPEAT

420 GCOL 0,128

:CLG

:6COL 0,129

430 XX=3+RND(7)

: YZ=3+RND (5)

: OX=RND(XX)

:F=0.5

:A\$="triangle ="

:A1\$="/ 2"

440 PROCtriangle

450 PROCdrawgrid

460 PROCtext

470 UNTIL FALSE

480 END

490 DEF PROCdraworid

500 FOR J=0 TO XX+0%

:REM VERT. LINES

510 MOVE x0+J*inc.y0

520 PLOT 5,x0+J*inc,y0+Y%*inc

530 NEXT

540 FOR J=0 TO Y%

:REM HORIZ. LINES

550 MOVE x0, y0+J*inc

560 PLOT 5,x0+(XX+0X)*inc,y0+J*inc

570 NEXT

580 ENDPROC

590 DEF PROCparallel

600 MOVE x0, y0

610 MOVE x0+0%*inc,y0+Y%*inc

620 PLOT 87,x0+(0%+X%)*inc,y0+Y%*inc

630 MOVE x0+XX*inc.y0

640 PLOT 87, x0, y0

650 ENDPROC

660 DEF PROCtriangle

670 MOVE x0, y0

680 MOVE x0+(XX-0X)*inc,y0+YX*inc

690 PLOT 87,x0+X%*inc,y0

700 ENDPROC

Maths listing

From Page 161

710 DEF PROCtext
720 PRINT TAB(0,23): "Area of "A\$
 " base # height "A1\$
730 VDU 28,0,30,39,24
 :CLS

:Len=LEN (A\$)+8

740 PRINT TAB(0,1) "Area of "A\$

750 REPEAT

760 INPUT TAB(Len+3,1) ""base

770 IF base()XX THEN PROChelp(1)

780 UNTIL base=X%

790 PRINT TAB(Len+8,1)"*"

800 REPEAT

810 INPUT TAB((Len+12),1) ""height

820 IF height()Y% THEN PROChelp(2)

830 UNTIL height=Y%

840 PRINT TAB (Len+18,1) A1\$

850 REPEAT

860 PRINT TAB(Len-1,2);"= "

870 INPUT TAB(Len+3,2)""area

880 IF area()XX*YX*F

THEN PROChelp (3)

890 UNTIL area=X%*Y%*F

900 PRINT '"That's right !"

910 REPEAT

:PRINT TAB(0,7) "Press any key

for another go ";

920 Y=GET

:UNTIL TRUE

930 ENDPROC

940 DEF PROCOptions

950 PRINT TAB(0,3)CHR\$ (128); CHR\$ (157);CHR\$ (134);CHR\$ (141)

:"Options"

960 PRINT TAB(0,4)CHR\$ (128);

CHR\$ (157); CHR\$ (134); CHR\$ (141)

;"Options"

970 PRINT TAB(5,7) CHR\$ (131);"(1)

Rectangles"

980 PRINT TAB(5,8) CHR\$ (131);"(2)

Parallelograms"

990 PRINT TAB(5,9) CHR\$ (131);"(3)

Triangles"

1000 VDU 31,4,18,131;

:PRINT "Choice ?";

1010 REPEAT

:Y=GET

:UNTIL Y>48 AND Y452

1020 Y=Y-48

1030 ENDPROC

1040 DEF PROChelp(E)

1050 IF E=1 OR E=2

THEN PRINT "Look at the shape

carefully"

1060 IF E=3 PRINT "Haven't you learnt

your tables yet !"

1070 z=INKEY (500)

1080 IF E=1

THEN PRINT ; TAB(Len+3,1);"

1090 IF E=2

THEN PRINT ; TAB(Len+12,1);"

1100 z=INKEY (1000)

1110 PRINT TAB(0,2); SPC (78)

1120 ENDPROC

This listing is included in this month's cassette tape offer. See order form on Page 165.



Beware of imitations.

Assembler - Debugger - Editor for the BBC microcomputer.

£60 incl. vat. 40 or 80T utilities disc- please specify. SYSTEM SOFTWARE Dept. B 12 Collegiate Crescent Sheffield S10 2BA

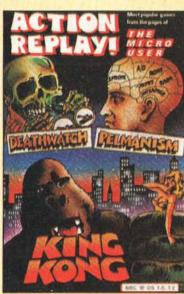


ACTION REPLAY!

Most popular games from the pages of

THE MICRO USER Available £5.95 Back
only from your Acorn thealer

Build up your own action-packed cassette library of these all-time Micro User favourites



Deathwatch Hold the fort against a combined tank and helicopter assault on your positions. Fast and furious — one of our most popular games.

Pelmanism Defeat the computer by remembering more pairs of cards than it can.

King Kong Use your helicopter to rescue two maidens from the Empire State building — avoiding a deluge of rocks from King Kong.



Barrel Battles Fast and furious video action.

Dodging an avalanche of deadly barrels you climb towards the telephone.

Frogs 'n' Dogs Loved by young and old alike. Simply take Freddy Frog for a walk, avoiding Fido and poisonous lilies!

Tenpins Stunning simulation of ten pin bowling. This addictive game will hold you spellbound.



Fruities Fast-paced, fun-packed extravaganza. Guide your man up ladders, avoiding — and digging traps for — the marauding Fruities!

Nim Find out just how nimble your mind is in this intriguing battle of wits against the computer.

Space Pilot Desperately fighting off hostile life-forms, you must dock with satellities to replenish dwindling fuel supplies.



Tower of London Ghosts have broken out of the Tower of London and taken the treasure. Can you recover, it?

Blackjack A true-to-life recreation of the casino favourite. Can you beat the bank?

Galactic Invaders The only thing between you and imminent destruction by waves of hostile aliens is your proton gun. A compulsive classic.



Robin and Marian Medieval melodrama! Rescue Maid Marian from the sheriff. A hilarious, action-packed game.

EECGAL In charge of the EEC's Picture Gallery, you have to put some order into the frames — but it's not so simple as it sounds.

Air Strike You need to fly fast and low for this dangerous intrusion into enemy air space.



Alien Intruders Stunning version of the all-time arcade hit. No one can resist this classic!

Goblins Frolics in fairyland! Guide Kaplan the pixie home through the forests, avoiding the nasty goblins — a delightful game.

Gone Fishing Superb simulation of a day on the riverside. This enthralling program will give hours of enjoyment.

THE MICRO USER

It's the biggest, brightest, most authoritative yet completely independent guide to the machine with so much potential you'll never tire of reading about its remarkable capabilities.

You can buy *The Micro User* from your local newsagent or station bookstall. Or fiil in the coupon opposite – your copy will then be delivered to your door each month.

Copies of *The Micro User* back issues are still available at £1.50 each

Cassette tapes and discs of Micro User Programs

Take our a year's subscription and have your cassette or disc posted to you each month. Start your subscription from any You can order on the coupon opposite. Contents are listed below:

MARCH 1983: Deathwatch, a superb arcade game Bingo, clever uses of the randomise functions, Bubblesort routines; Tests function keys in machine code. 0.1 Colour and Graphics Routines; creen designs.

APRIL: King Kong, rescue girls from the Empire State Building before killing Kong, Nim, a structural game of strategy. Tokens, unravel the Basic ROM: Formatter, an essential disc utility: Disassem, a full machine code disassembler.

MAY: Air Strike, a fast and furious arcade game; Test your mental powers with Pelmanism; Anagrams, the word game. Character, generate vertical and inverted text. Teletext, animation in Mode 7. Beeb, two joystick exercises.

JUNE: Space Pilot, lost in space you must light off repeated attacks from alien life forms. Nomism, you are a nomadic herdsman desperately trying to cke out a living on the plains of Africa. Colourful Characters Plus other listings from the June issue. JULY: Tenpin, a simulation of Tenpin Bowling: Spacepods, beat the alien hordes: Cup, exciting 3D graphics techniques Test and Steady, programs to accompany the Beeb Body Building Course. Breakfix, don't let Break destroy your precious variables!

AUGUST: Fruities, driven by strange urges you climb the ladders of adventure to risk all in the gardens of unearthly frights. Animation, a suite of programs that really bring your screen alive. Casdise, the machine code downloader for your disc system; Mode 7 colour routines.

SEPTEMBER: Robin & Marian, rescue Maid Marian from the Sheriff of Nottingham. Galactic Invaders, an exciting arcade game. DFS Benchmarks, 14 DFS test programs. Animation, new techniques. Terminal, connect a BBC Micro to a mainframe.

OCTOBER: Fishing, a compulsive day's angling. Joykey, convert programs to joystick. Pentest and Bellringer, for Micro User lightpens. Contours, an educational program. Link BBC Micros to each other. Plus all the listings from the first Electron User.

nd othe

programs ted in the and other

programs listed in the pages of The Micro User Vol. 2, No. 2.



NOVEMBER: Goblins, an enchanted journey. Blackjack, the casino favourite. Charge and Pendulum, Body Building Course part 9. Sideways, programs in ROMs. Pendraw, a light pen sketching program. Plus all the programs from the second Electron User.

DECEMBER: Tower, rescue London's treasure. Santa, help Father Christmas deliver his presents. VDU 23, an invaluable character defining utility. Paged, the listing from our paged graphics article. Plus all the listings from the third issue of Electron User.

JANUARY 1984: Barrels, an all-action arcade game. Noteplay, an entertaining musical utility. Dump1 and Dump2, multitone screen dumps. All the programs from our Sound. Beginners' and Graphics articles Plus 12 programs from the fourth Electron User.

FEBRUARY: Invasion, the classic arcade game. Frogs, fun for all the family. Engygen, a logic game. Balance, a number learning program. Key, single key entry for the BBC Micro Plus nine other programs from The Micro User.

MARCH: Mazemunch, blockbusting arcade action. Birthday, family fun for our anniversary. Derrick, number fun for infants. Pixelpen, high resolution for lightpens. Loadtape, a recovery utility. Plus 18 other programs from the pages of *The Micro User*.

APRIL: Microgolf, the simulation. Eastermaze and April Fool, seasonal games. Seawall and Magic Square, maths fun. Filer and Album, a database of sounds. TRX1, TRX2, RS243 driver. Heartrate, monitor your fitness.

MAY: Dug Dig, asteroid adventures. Damraider, naval action. Envaid, easy envelopes Steppers, Body Building motor control. Spiro, graphics windows. Adventure, a trapdoor maze. Renumber, program trum true pages of the Micro User Vol. 2 No. 4 User Control C

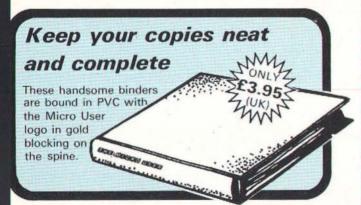
and other programs listed in the pages of BBC Micro User Vol. 2, No. 3 JUNE: Roadracer, 3D driving action. Quadline, four in a line logic game. Monitorone, Monitortwo, machine code debugging routine. Toolkitone, Toolkitone, 271 disc controller explored. Areas, easy maths. Spell, spelling education. Spokes, simple, beautiful graphics.

Take out a year's subscription NOW!

Make sure you get your copy of *The Micro User* HOT OFF THE PRESS – month after month for the next year.

COMPLETE THIS COUPON TODAY







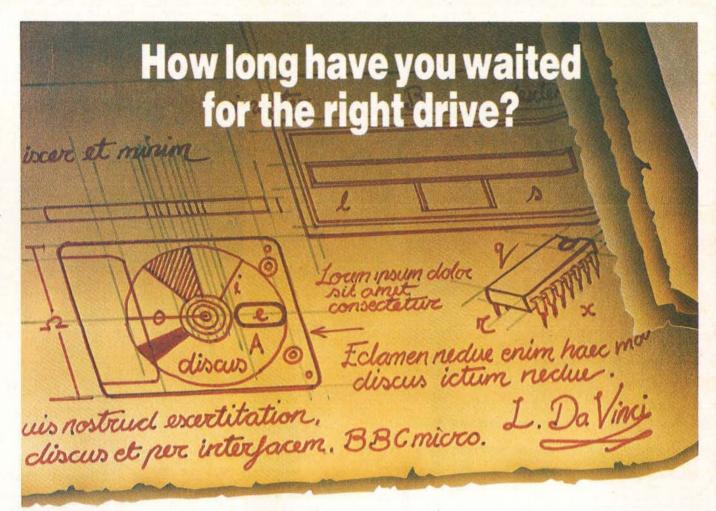
ORDER FORM		
All prices include postage, packing and VAT, and are valid to June 29, 1984		
Please enter number required in box	£	р
Micro User		
annual subscription EIRE £15 (IR £18) Surface mail – Rest of world £20 Air mail – Rest of world £65		
Selected free cassette (month)	4	
Commence with issue TOTAL	-	
Micro User March 1983		
£1.50 UK June 1983 April 1984 May 1984		
Aug 1983 E1.75 - Overseas Sept 1983		
(Surface mail) Oct 1983		
Airmail prices On application. Nov 1983 Dec 1983		
TOTAL	-	
Annual subscription £40-Tape £70 - Disc		
for tapes and discs" (UK & Overseas)		
Commence with(state month) TOTAL		
Single copies of Deathwatch Mar 1983		
tapes and discs* King Kong April 1983 Air Strike May 1983		
£3.75 - Tape Space Pilot Jun 1983 Tenpin Jul 1983		
£5.75 - Disc Fruities Aug 1983 (UK & Overseas) Robin & Marian Sep 1983		
Blackjack / Goblins Nov 1983	*	
*Please indicate which Barrel Battle Jan 1984		
DFS and disc format Alien Invasion Feb 1984 you require: Mazemunch Mar 1984		
Acorn 40 track Microgolf April 1984 Damraiders May 1984		
Amcom 80 track Road Racer June 1984		
Watford Other TOTAL	_	
Dust Covers		
£3.95 - Deluxe		
(UK & Overseas) TOTAL		
Binders		
£3.95 – UK		
£5.00 - Overseas		
Payment: please indicate method (/) TOTAL		
Access/Mastercharge/Eurocard	=	
Barclaycard/Visa American Express Card No.		
American Express		
Cheque/PO made payable to Database Publications Ltd.		
Name	-	_
Address		-
		-
Signed		
Send to: Micro User, FREEPOST, Europa Ho 68 Chester Road, Hazel Grove, Stockport SK	use, 7 5N	Υ.
(No stamp needed if posted in UK) Please allow 28 da	ys for	delivery
You can also order by phone or Pre-		
Any of the goods listed here can be ordered by telephone. No subscribers and other users of Prestel can also use the Pres	licror	net ailbox.
Telephone: Prestel Mail	The second	

061-480 0171

24 hours

Don't forget to quote your credit card number

614568383



THE FIRST CHOICE FOR THE B.B.C. MICRO

THE UNIT Precision engineered by Hitachi using tomorrow's technology today. Housed in a High Stability aluminium one piece casing for durability and smooth function. The case is finished in a tough epoxy coating which complements the BBC micro and other quality equipment.

complete Package Supplied with data and power cables, utility disc, and instruction manual. Ready to plug in and use. Compatible with all known disc interfaces for the BBC micro. Powered by the BBC micro – no extra power supply required. 12 month parts and labour guarantee.

THE MEDIA The disc is encased in rigid plastic and the disc surfaces are protected by a stainless steel shutter which is automatically opened and closed by the disc drive.



SPECIFICATIONS Track to track access time is 3 ms. Data transfer rate 125 Kbs⁻¹. Dual double sided Disc drives give 1 Megabyte of online storage.

TERMINOLOGY GUIDE		
	A single sided drive accesses one side of a disc at a time.	
	Dual single sided drives access two sides at a time.	
	A double sided drive accesses both sides of a disc at a time.	
	Dual double sided drives access all four sides at a time. No need to turn discs over in double sided drives.	
	Unformatted capacity of one disc is 500K (double density), 250K (single density).	

Please send me:	Name
Single Disc Drive Double Sided Pack @ £252.00.	Address
Double Disc Drive Double Sided Pack @ £491.50.	
Single Disc Drive Single Sided Pack @ £195.85.	
Double Disc Drive Single Sided Pack @ £360.60.	
Pack of 5 3" Discs @ 622.50. All prices include	Access
Pack of 10 3" Discs @ £41.00. VAT, post and packing.	
Generous Dealer Terms Available.	



SAVINGS

-0000000000000000000000000000000000000	NEWS STATES	
PRINTERS BROTHER HR 15 TRACTOR SHEETFEEDER KEYBOARD	EX VAT 340.00 62.00 185.00 135.00	391.00 71.30 212.75 155.25
EPSON RX80T EPSON RX80F/T EPSON FX80F/T EPSON MX100F/T EPSON RX100F/T EPSON RX100F/T FX80 TRACTOR	212.00 237.00 324.00 365.00 420.00 350.00	243.80 272.55 372.60 419.75 483.00 402.50 34.50
JUKI 6100	335.00	385.25
MANNESMANNTALLY MT 80	199.00	228.85
OKI MICROLINE 80AP OKI MICROLINE 82A OKI MICROLINE 83A OKI MICROLINE 92P	180.00 255.00 395.00 379.00	207.00 293.25 454.25 435.85
SEIKOSHA GP100A	165	189.75
SHINWA CP80	182	209.30
STAR GEMINI 10X STAR DELTA 10	199.00 £305	228.85 £350.75
COMPUTERS COMMODORE 64 COMMODORE 1541 DISK COMMODORE C2N CASSETTE INTFACE 64-PAREL	152.17 165.21 36.51 59.50	174.99 189.99 41.99 68.43
APRICOT 2*D+MON APRICOT 10MB	1475.00 2395.00	1696.25 2754.25
SANYO MBC555 SANYO MBC550	905.00 695.00	1040.75 799.25
EPSON QX10	1600.00	1840.00
tion and more than telephone board and forth-	-	TO 00

MAYFAIR MICROS 362 YORK ROAD, LONDON SW18 1SP 01-870 3255

D.A. COMPUTERS LTD. **BBC ACORN COMPUTERS IN LEICESTER** 7

Specialists in hardware and software. Fully authorised ACORN-BBC Dealer.

Complete after sales service - repairs and maintenance contracts.

Two of the most useful utilities for the serious BBC User. SCREEN DUMP ROM

This 8K page ROM will print out any graphics screen (except mode 7) upright or sidewise, ×1, ×2 or ×4 scale on a variety of matrix printers including Epson, Shimwa, Star, NEC, Seikosha, KDC, etc. It will also substitute up to eight shades of grey to represent screen colours. Mode 7 text and graphics can be printed on the FX80 or FX100 only (e.g. telextext screens). This Machine Code software will give you the fastest print out possible on your printer. Page ROM software means you have all the RAM available for your own programmes. Full documentation provided. £20.00

MACHINE CODE MONITOR ROM

MACHINE CODE MONITOR ROM
Provides powerful facilities for monitoring and debugging machine code and BASIC programmes. Includes single step, break points, disassembler, memory scan "window", search for string or byte sequence, memory move, etc. Also provides BASIC program search and literaturishing for the statement of the statement of the sequence list variables. Extensive documentation £20.00

BBC Model A and B Microcomputers and Electrons always in stock

PRINTERS	BROTHER Daisywheel	£458.85	
	EPSON FX80 Printers at	£399.00	
	EPSON RX80F/T Printers at	£299.00	
	SHINWA CP80 Printers at	£279.00	
	KDC LOGITEC Printers at	£299.00	
	Many other printers in stock		
MONITORS	MICROVITEC 14" COLOUR - ST. RES. at	£228.85	
MONITORS	MICROVITEC 14" COLOUR - MED. RES. at	£343.85	
	MICROVITEC 14" COLOUR-HIGH RES. at	£503.70	
	TECO 12" GREEN SCREEN (18MHz Bandwidth)	£107.00	
	PHILIPS 12" GREEN SCREEN	£71.30	
DISC DRIVES	Single Teac 100K	£172.00	
	Single Shugart 100K	£199.00	
	Single Mitsubishi 400K	£214.00	
	Single Mitsubishi 40/80 switchable	£228.99	
	Dual Mitsubishi 800K	£409.00	
	Dual Mitsubishi 40/80 switchable	£439.00	
THE RESIDENCE AND ADDRESS OF THE PERSON OF T			

Also a wide range of Books, Software and accessories for the BBC micro.

All our prices include V.A.T. - but add £5.00 carriage for heavy items (Printers, Monitors etc.)

Please call and visit our showroom at:-

D.A. Computers Ltd.

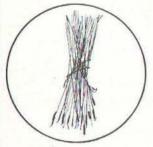
(5 minutes walk from railway station).

104, London Rd., Leicester.

Tel. (0533) 549407

We close all day Monday and Sunday otherwise open 9am to 5pm.

I BET YOU'VE NEVER BEEN ATTACKED BY A UNIVERSITY BEFORE



Price £6.90 Woolel B arket and bank etc species of animal, a ncludes four crops, four children. Very versatile, bis ne se seu 101 lation, for enjoyment or -umis gnimist xalqmoo COMMUNITY IS 8



(l gnints to sosio (Comes with free three lating game for the model B. challenging and stin assembling the thirteen pieces of the Golden Crucifix, A complicated, onlecting and BAIL WITCH GROTTY BELLY country village of the where you must rid a ехсиний эдленинь дан THE HAUNTING IS 80



BBC Model B Price £8.00 scenery and interesting

multi-program arcade adventure with detailed 6 si tasa ant of sebing

set in a surreal world of the future, salzzud gnizest teed bne their journey through treacherous landscapes protects the warriors on odw bissiw lehommi na ho power. You play the part a quest to save the world by restoring the assemble and embark on a band of past heroes ten to envelop the day, EAST: Shadows threa-BRIDGE TO THE



on screen-scoring, colourful factory displays and exclusive biographies of the writers.
Free gift with first 42 orders, Buy-now while socks last!
Price 1 free gift with first 42 orders.

day before Christmas comes? Features fast Machine-code animation and movement,

HIDEOUS, GHASTLY Flying University and it's sidekick the MONSTROUS FIEND Eric the Blob! Can you save the from his presents, which are attacking him! Don't worry about chicken Vindaloos, they're old hat, beware instead the Christmas's toy Factory. Santa has been turned into a toilet by the wicked witch Grotty Betty, and you must protect him turned from a teacher into a microphone stand in Father THE CLICHE: An exciting arcade game in which you are



BBC Model 8 Price £8.00

before it's too late.
Super-last graphics,
increasing difficulty,
to you have a super-last of super-last of super-last su

defuse these bombs their cave-bases and you drive out the rebels from mines on the surface, to Invaders plant powerful ground groups. The -19bnu ofni savlazmadt The last humans resist mot bne ,elut tiedt ander the rule of aliens. THE EARTH IN 2052 IS Based on CHECKMAN. INNERZONE SHIFT:

"Teachers . . . should find this very useful" "A good program in it's own right" Micro User March 1984. Review for COMMUNITY. "Quite a challenge & well worth the money" "Like getring five games in one" "Top quality graphical layout" Micro User March 1984. Review for BRIDGE TO THE EAST.

IXION TURNS THE SOFTWARE INDUSTRY UPSIDE DOWN

Allow 21 days for delivery cheques/PO's payable to 'IXION SOFTWARE' Write to: "IXION SOFTWARE" 10, The Crescent, Lympsham, Weston-super-Mare, Somerset BS24 UBH.



National Micro

MANY ITEMS IN OUR SPRIN

DATA STORAGE

A data cassette recorder that perfectly matches the BBC Micro £34.74

Fully compatible with the BBC Micro and specifically designed for data saving and loading, the Pye data cassette recorder (with free power pack and BBC lead) is guaranteed to end your data storage and retrieval problems.

The Hobbit High speed floppy tape system ...
(No interface required).
New low price of £113.76
Zero memory option £25.00
(£18_if ordered with the Hobbit)

Our range of high quality drives below are all cased in metal to prevent interference and data loss

AMS 3" disc drives AMS-3(S) 100k Single £195.00 AMS-3(T) 200k Double £347.00

Cumana slim disc	drives
CSX 100 single	£149.00
CSX 200 single	£193.00
CSX 400 single	£215.00
CS 100 single	£169.00
CS 100E single	£153.00
CS 200 single	£209.00
CS 200E single	£195.00
CS 400 single	£233.00
CS 400E single	£219.00
CD 200 dual	£305.00
CD 400 dual	£386.00
CD 800 dual	£431.00
CD 400S 40/80 trad	ck
switchable dual	
CD 800S 40/80 trad	ck
switchable dual	£499.00
We are sutheringer	Comme

We are authorised Cumana distributors – dealer enquiries welcome.

New low prices Pace slimline disc drives

race simmine disc	arives
Pace PSD1 100k	
Single	£149.00
Pace PSD2 200k	
Single	£212.00
Pace PSD3 400k Sir	ngle (40/80
track, switchable).	
Pace PSD4 400k Sin	
(80 track)	£215.00
Pace PSD5 200k (40	0/80
track, switchable).	£225.00
Pace PDD2 400k Do	ouble
(40 track)	£420.00
Pace PDD3 800k	
Double (40/80 tra	
switchable)	£499.00
Pace PDD4 Double	
(80 track)	£417.00
Pace PDD5 Double	
(40/80 track)	£436

All drives include one free blank diskette. Single drives can be supplied in dual cases with blanking plate. Please contact us for prices when required. Special prices are available for quantity purchases

PREI Replica II
This utility, enabling you to transfer your programs from tape to disc, is offered FREE with each disc drive purchased

NEW ADD-ONS

Sweet Talker (Cheetah). The latest speech synthesis device for the BBC.

Easily fitted - no soldering. Uses allophone system – gives unlimited voc abulary. All normal BBC sound

features are unaffected. Available now! Superb value at £21.50

Sureshot Joystick: A really high quality joystick for the BBC Micro.

Self centering action Two fire buttons.

Rugged construction

£16.50

COMMS

Micronet

We invite you to join one of the world's largest databases. To join Micronet you need:

 Prestel/Micronet subscription . £13.00/qtr.
This will be invoiced to you by Prestel; application forms included with each order. Hardware

*Modem 1000 £5 or Telemod II (includes automatic transmit/receiv £73.87 switching) Software Cassette based £13.00 or ROM based

Acom Teletext Receiver Enables you to download programs and access the £195.65 Ceefax database ...

Pace Communications Commstar easy to use communications ROM enables BBC to 'talk' with other micros (Modern required). £29.57

CONSUMABLES

(box of 10)	
Hobbit micro cassette (box of 6)	
Double sided (100k x 3" discs	
Single sided, single density CDC discs	
(box of 10)	£16.09
density BASF discs (box of 10)	

UTILITIES

Toolstar A powerful new utility ROM which adopts a new approach to program £29.57 development aids.

MICROS

No waiting! Phone in your order for the BBC Micro before 12 noon and we'll despatch same day! BBC Model B Latest specification OS 1.2 £346.00 BBC Model B Includes Acom £407.82

CHAMELEON

This is a MUST for programmers - take your pick from 4,096 colours! Let Chameleon bring your programs to life with truly authentic colours. Mix and match the exact shades you require to give new depths of realism to your graphics. Choose from all the colours of the rainbow – and more! It's that simple . . . with this amazing hardware add-on for the BBC Micro. Phone for details RGB version

DISC UTILITIES

Replica II	£10	0.43*
The Key	£1	1.26

State 40 or 80 track. Offered free with any disc

MONITORS

£215.00

Microvitec 1451 medium resolution. Microvitec 1431 low resolution £
Microvitec 1431P colour

monitor and composite

video £249 Kaga 12" amber screen high £249.00 resolution £119.00
Kaga 12" green screen high
resolution £109.00
Zenith green screen £75.00 -Remote control ... £230.00 Specially designed for use both as a monitor and a television (not just a modified TV), the Nordmende represents a perfect answer to the over-use of the domestic TV – at a price less than many comparable colour monitors.

The above prices are inclusive of connecting leads for the BBC Micro.

Personal shoppers can obtain the products advertised on these pages from the following retail stores:

 Stockport Micro Centre, 4/6 Brown St., Stockport, Greater Manchester. (Tel: 061-480 0539).

 Wilmslow Micro Centre, 62 Grove Street, Wilmslow, Cheshire. (Tel: 0625 530891).

ADVENTURE/ LEISURE

Acomsoft	
100 Programs	£8.65
Castle Riddles	
Countdown Doom	£8.65
Crazy Tracer	
Kingdom Hamil	£8.65
Philosophers Quest	
Sphynx Adventure	£8.65
The Examiner	£8.65
BBC Soft	
Dr Who	£8 70
Bug-Byte	
Twin Valley Kingdom	£8.26
Digital Fantasia	
10 Little Indians	£8.95
Arrow Death Part 1	
Arrow Death Part 2	
Circus	
Escape Pulsar 7	£8.95
Feasibility Experiment	

£6.04 £6.91
£6.91
£6.96
£8.65
£6.04
£6.04
£6.04 £6.04
£6.91
£6.91
£6.91
£6.91 £6.91

ELECTRONS NOW IN STOCK

£8.95
£8.95
£8.95
£8.95
£6.04
£8.95
£8.65
£8.26

ARCADE GAMES

A&F	-
Cylon Attack	£6.87
Chuckie Egg	£6.87
Acornsoft Arcade Action	F10.35
Arcadians	£8.65
Chess	€8.65
Cube Master	
Drafts Reversi	
Hopper	
JCB Digger	£8.65
Meteors	€8.65
Missile Base	€8.65
Sliding Block Puzzle	
Snapper	
Spooker	£8.65
Snooker Starship Command	CQ 65
Super Invaders	C8 65
Attack	66.06
Alligata	20.90
ABM	C5 17
Bug Blaster	£6.17
Contract Bridge	£5.71
Cosmic Asteroids	£6.01
Dambusters	
Eagle Empire	
Fruit Machine	
Lunar Rescue	
Monaco	20.91
Primary ArtBBC Soft	16.91
BBC Son	00 70
Canyon	28.70
White Knight	19.14
Computer Concepts Android Attack	
Android Attack	£7.78
Snake	£7.78
DACC	
747 Flight Simulator	£6.91
Space Shuttle	£6.91
	~~~
Lothlorien	00.04
Battlezone 2000	10.04
Johnny Reb	16.04
Roman Empire	26.04

Bumble Bee	£6.	91
Bumble Bee Caveman Adventure	£6.	91
Chess	£6.	91
Cosmic Combat	£6.	91
Cowboy Shootout	£6.	91
Croaker	£6.	91
Cybertron Mission	£6.	91
Danger U.X.B.	to.	91
Demon Decorator Escape Moonbase A	to.	91
Estable Moonbase A	20.	91
Felix Factory	£6.	01
Galatic Command	£6.	91
Ghouls	26	0
Hell Driver	56	04
Hell Driver Intergalatic Trader	£6.	91
Jet Power Jack	£6	91
Killor Govilla	66	01
Labrynths Lacos Laser Command Martian Attack Moon Raider	£6.	91
Laser Command	£6.	91
Martian Attack	£6.	91
Moon Raider	£6.	91
Ivemesis	TO	-91
Positron	£6.	91
Space Jailer	£6.	91
Swoop	£6.	91
The Mine	£6.	91
Timetrek Wizards Challenge	£6.	91
Wizards Challenge	£6.	91
Zarm	£6.	91
Softspot		
Transistor's Revenge	£6.	91
Software Invasion		
Attack on Alpha Centuria	£6.	9
Vortex	£6.	91
Romik		
Alien Breakin	£6.	08
Atom Smasher	£6.	08
Birds of Prev	£6.	08
Shark Attack	£5.	01
Superior Software		
2002Alien Dropout	£6.	91
Alien Dropout	£6.	91
Centipede	£6.	91
Colditz Adventure	£6.	91
Crazy Painter	£6.	91
Crazy Painter	£6.	91
Fairground Frogger	£6.	91
Frogger	£6.	91
Fruit Machine	£6.	91
Galaxians	£6.	91
Gideons Gamble	£6.	91
Hunchback	£6.	91
Invaders	£6.	91
Lost City	to.	71
Pontoon	to.	91
Koad Kunner	to.	71
Space Fighter	LO.	71

Star Trek Adventure .....

# Centres

### MAIL ORDER DIVISION

Phone your order 061-429

24 hours answering service outside office hours. Or use the order form below You can also order via Prestel. Mailbox number 614298080

#### ALE - RING FOR DETAILS

#### ACORNSOFT DISC-BASED SOFTWARE

		C
Games		Sentence Sequencing £13.35
Philosopher's Quest	£10.00	Number Balance £13.35
Aviator		Missing Signs£13.35
Monsters		Chemical Analysis £15.00
Snapper		Chemical Simulations £15.00
Rocket Raid		Chemical Structures £15.00
Sphinx Adventure		Jars£13.34
		Temperature Control £10.00
Cube Master		TO THE PROPERTY OF THE PROPERT
JCB Digger		Languages
Meteors		Forth £17.30
Arcadians		Lisp £17.30
Planetoid		Lisp £17.30 BCPL (ROM & Disc) £86.65
Super Invaders	£10.00	Microtext £52.00
Missile Base	£10.00	6502 Development
Countdown to Doom		Systems £43.35
Snooker		Turtle Graphics £17.30
Starship Command	£10.00	S-Pascal £17.30
Hopper	£10.00	Lisp Demonstrations £10.00
Carousel	£10.00	BCPL Calculations £17.30
Kingdom of Hamil		
Crazy Tracer		Business
Drogna		Database
Free Fall		Invoicing £21.70
Meteor Mission		Mailing £21.70
		Accounts £21.70
Education		Stock Control £21.70
Tree of Knowledge	610.00	Order Processing £21.70
Word Hunt	C13 35	Accounts Payable £21.70
		Purchasing £21.70
Word Sequencing	L13.33	ruiciasing £21.70

#### BARGAIN OF THE MONTH

Ghouls - The new one from Micropower
Just like a fairground ghost-train!
Special price valid to
June 30, 1984 ......£5.99

# How to get a generous discount on all



#### your purchases!

WHATYOUDO

Either purchase three items of software for the price of two (lowest priced item free) or make purchases to the value of £100 or more.

#### WHAT YOU SAVE

- All subsequent purchases totalling over £25 are eligible for discount* of:
  - 10% on software 5% on hardware when you quote your membership number.
- If you buy at least one item of software every month you get 10% discount on all such purchases. Ask for a registration card to take advantage of this scheme.
- The opportunity to enter the members' competitions run throughout the year. Just ask for competition entry form when you send in your order.

Ask for an application form at any of our outlets or write for a form to:

National Micro Centres Computer Club, 36-38 St Petersgate, Stockport SK1 1LH.

 Discount only applies to our normal prices and not to any special offer prices which may be in force for the time being.



#### GRAPHICS/ UTILITIES

OTILIT	150
Acomsoft	
Creative Graphics	£8.65
Graphs & Charts	£8.65
Picture Maker	£8.95
Turtle Graphics	£14.65
6502 Devel System .	
BCPL	£86.65
Forth	
Lisp	£14.65
Microtext	£43.35
5-Pascal	£14.65
Computer Concep	
Graphics (ROM)	
Disc Doctor (ROM)	£28.00
Gremlin (ROM)	£28.00
Termi (ROM)	£28.00
Printmaster (Rom)	£28.00
DACC	
Sprite Generator	£15.61
Oakleaf	
Paintbox	£8.65
Screenplay	
Paintbox	£8.65
Animator	£10.39

#### **EDUCATION**

ACV	
A.S.K.	COLE
Children Space Cranky	£0.00
Cranky	£8.03
Facemaker	£8.65
Hide 'n' Seek	£8.65
Lets Count	£8.65
Number Chaser	£8.65
Number Gulper	£8.65
Number Puzzler	£8.65
Table Adventures	£8.65
Words Words	£8.65
Acornsoft	
Algebraic Manip	£8.65
Business Games	£8.65
Chem Analysis	£12.00
Chem Simulation	£12.00
Chem Structures	£12.00
Jars	£10.35
Missing Signs	£10.35
Number Balance	£10.35
Peaks Computer	£8 65
Peeko Computer Sentence Sequencing	£10.35
Tree Knowledge	68 65
Word Hunt	£10.35
Word Sequencing	£10.35
word Sequencing	£10.33
BBC Soft	07.00
Early Learning	£7.96
Fun Games	18.70
Taxcalc	£15.00
Vu Type	£14.00
Comp Programs 1	£8.70
Vu Type	£8.70
IDo	£11.00
Crime Detection	£11.00
History Quiz	£11.00
History Quiz Music Quiz	£11.00
Royalty Quiz	£11.00
Science Fiction	£11.00
The Dating Game	£11.00
Theatre Quiz	£11.00
BBC Soft	
Painting	CR 70
Drawing	£8.70
Garnes Strategy	£8.70
Music	CO 70
TaglDan	C19.70
ToolBox	110.20
Clares	05.00
Joystick Utility	£5.ZZ
Replica II	110.43
Shadow	16.95
Singlekey Entry	£4.35
The Key	£11.26

Grafkey	£11.26
Grafkey	£7.82
B.E.S. Animal Veg/Min	27 90
Lineary Lattern	07 00
Happy Numbers Happy Numbers Map Rally Timeman One Timeman Two	£7.80
Map Rally	£7.80
Timeman One	£7.80
Timeman Two	£7.80
Word Hang	£7.80
World Wise	£7.80
Chalksoft	
Invisible Man	£6.04
Angles	
Ants	£8.04
Capital Letters	£9.78
Das Schloss Decimals	£8.04
Fiffel Tower	£8.04
Eiffel Tower Gobbledegook Gravity & Forces Hot Line Inkosi	£8 04
Gravity & Forces	£9.78
Hot Line	£9.78
Inkosi	£6.04
Letters	44 /26
Metrics Quiz Note Invaders	£9.78
Note Invaders	£8.04
Pirate	£8.04
Puncman 1 & Z	£8.04
Puncman 3 & 4	CR 04
Rhuthm & Pitch	£9.78
Sequences	£6.04
Storv A	£6.91
Top of the Pops Triangles	£8.04
Triangles	£9.78
Words & Pictures Wordskill	£8.04
Wordskill	£8.04
Optima Optimon	
Optimon	£6.04
Datext Marklist	£7.78
Marklist	£7.78
Quicksilva Beebart	C12 00
Music Processor	£13.00
Music Processor Simon W Hessel G.B. Ltd	113.00
G.B. Ltd	£6.04
Inheritance	15.17
Triple Pack	£15.61
World Travel	£5.17
Clares Counting	2000
Counting	£5.22
Hue Men	
Intro	18.70
Matching	£0.09
Shape Men The Garden	£6.95
Diamondsoft	20.50
Maths Spell	£6.91
Golem	
Education 1	£6.96
Education 2 Fun with Words	£6.96
Fun with Words	£6.96
Katakombs	£5.17
Logic & Cunning	£4.30
Katakombs Logic & Cunning Superlife Good Housekeeping	£4.30
MrT Alphabet	£11 96
rapriduct	~11.20

MrT Measuring	£11.26	
Mr T Money Box		
Mr T Number Game	£11.26	
	£11.26	
Mr T Tells Time	£11.26	
Cosmos		
Spanish Level B	£8.65	
French Level A	£8.65	
French Level B		
German Level A	£8.65	
German Level B	£8.65	
Spanish Level A	£8.65	
Micro Power		
Where	£6.91	
World Geography	£6.91	
Mirrorsoft		
1st Steps Mr M	£7.78	

#### BUSINESS

BUSINES	0
Acomsoft	
Accounts Payable	£21.70
Accounts Receiveable	£21 70
	£10.35
	£10.35
Desk Diary	
Forecast	£10.35
Forecast	£21 70
Mailing System	621 70
	£10.35
Order Processing	£21.70
Pers Money Managem't 1	
Purchasing	
S.C. Magic Garden	68 65
Stock Control	20.00
View	
View Printer Driver	00 65
View Sheet	CEO.00
BBC Soft	£52.00
	00.70
Home Finance	
Record Keeper	£12.00
Computer Concepts	00 00
Wordwise (ROM)	£36.00
Diamondsoft	
Business Accounts	
Flexifile	£12.13
Home Accounts	£6.91
Gemini	
Cashbook	E52.13
Database	£17.35
Easi Ledger 1	£17.35
Final Accounts	£17.35
Graph Plot	£17.35
Home Accounts	£17.35
Invoice & Statements ! Maillist	£17.35
Maillist	£17.35
Payroll	€34.74
Spreadsheet	€17.35
Spreadsheet	217.35
Word Processor 1	217.35
Merlin	
Scribe 1	252.13

All prices exclude VAT. UK customers please add 15%.

	Please supply the fo	llowing	120m	To	tal
ltem	t mass supply site for	motorrigi.	Qty	£	Р
		****	SENSESSEE N	entrepes	60.00
			C STEICHIE		*****
DESCRIPTION OF THE PARTY OF THE					
	****				
	+1(V))		-		
	ather could be no		VAT 15% .		******
	ctive credit terms		VAT 15% .	FRE	É
				FRE	E
P	hone for details	Name	Camage	FRE	E
Please indic		Name Address	Carriage TOTAL	FRE	E
Please indica	thone for details ate method of payment:		Carriage TOTAL	FRE	E

Signed

MU/6



## **TOOLKIT ROM**

#### **BASIC Programmer's Aid for the BBC Micro from BEEBUGSOFT**

It is possible to program in BASIC without TOOLKIT but its not very smart

"TOOLKIT is an essential utility for all Basic programmers using the BBC Micro . . . The range is enormous . . . An indispensable aid packed full of powerful utilities".

**EDUCATIONAL COMPUTING MARCH 1984** 

"... Should speed up the process of programming considerably . . . TOOLKIT is highly recommended".

**PCN MARCH 17 1984** 

TOOLKIT is an indispensable aid to Basic programming on the BBC Micro. It gives instant access to a set of powerful utilities held in ROM.

These will get you out of trouble like the *RECOVER, or just make life much easier, like automatic listing of error lines, search and replace, list variables, procedures . . . etc.

TOOLKIT features an extremely powerful editor, allowing the use of cursor keys to list a program line-by-line in either direction and move to any part of a program to overtype or insert new code and corrections.

TOOLKIT also contains a powerful facility to trap an error in a Basic program as it runs. It will then automatically enter the Screen Editor, display the line in error and position and cursor at the statement at fault.

CO	13.00	Ph 29	A		20
	17/1	IVI	44	IM	115

*NEW

*CHECK Verify a program or data in memory with disc/cassette.

*CLEAR Clear all variables including

integers.

*EDIT Enter full screen editor. *FREE Display free memory and

pseudo variables *HELP INFO

Displays various useful system information.

*MEMORY Display memory contents. *MERGE Merge two programs.

*MOVE Move program to run at specified

address. As New, but can be issued from

within a program. *OFF Cancel enhanced error handling.

*OLD As Old, but can be issued from within a program.

*ON Auto error handling - enters editor at line in error.

*PACK Efficient program compactor.

*RECOVER Intelligently recover bad programs. *RENUMBER Allow partial renumbering.

*REPORT Extended error reporting facility. *SCREEN Screen dump to cassette or disc.

*UTIL 1 String Search. *UTIL 2 String Search and Replace. *UTIL 3 Move Basic program lines. *UTIL 4 List Procedures and Functions. *UTIL 5 List values of A% to Z%.

*UTIL 6 List Numeric Variables. *UTIL 7 List String Variables.

*UTIL 8 List Names of Arrays. *UTIL 9 Set up range for Utilities 1 and 2.

> BEEBUGSOFT is the Software house of BEEBUG Publications Ltd.

- Just plug it in, no loading necessary
- 27 new commands to make life easier
- Saves hours in program development and debugging
- Supports both cassette and disc systems
- No command name conflict with other Roms
- Ideal for expert and novice alike
- Fitting instructions and a 32 page manual supplied
- You'll wonder how you ever managed

BEFRUCSOFT, POBOX 109 HIGHWYCOMBE BUCKS Send chequelos in other au ches for the chequelos in the control of the chequelos in the control of the chequelos in the cheq Address

#### What has Electron User got for **BBC** Micro users?

The answer's simple . . .

## LISTINGS!

Pages and pages of them. Games, graphics demonstrations, utilities, they're all there. Also there are hardware reviews, hints and tips, regular features like Casting Agency and Sounds Exciting, Pete Bibby's beginners articles and the graphics series.



All Electron User listings will work on BBC Micros with OS 1.2 and Basic II. Even with Basic I machines and earlier OSs the vast majority of the programs will work without modification.

In the June issue you'll find action games, arcade classics, logic games and more. Avoid the ghosts that lurk in the maze. Strain your brain and solve the coloured code. Simplify text colours and work out your VAT. Explore simple programs in depth and enjoy your micro's graphics abilities. And while you're at it you can find out what little green aliens are made of . .

Now on sale at your newsagent!

#### NEWARK VIDEO CENTRE PRESENTS

#### SUPER CLEAR COMPUTER DISPLAY - AND A TV!!!

AN RGB MONITOR - WITH TV RECEPTION

14½" C2402/RGB £275.00 - 20" C6100/RGB £365.00 16" C3104/RGB £299.00 - 22" C7100/RGB £399.00 16" C3404/RGB with Remote Control (Teletext Extra) £350.00 26" C8400/RGB with Remote Control (Teletext Extra) £465.00

All prices include VAT, a 12 month guarantee, a 6 pin DIN lead, a mains plug and carriage to your door. All are Grundig TV's supplied with Grundigs consent. Educational and quantity discounts are available.

#### What 'What Micro' said:

"The colours are just unreal like the 'simulated' pictures in TV advertisements". "The best of all images came from this set". "A very reasonable comparison could be made with colour monitors costing several hundreds of pounds"

NEW! 1 input-6 output RGBS Distribution Amplifier - £250.

For details of the full range contact:-

#### **NEWARK VIDEO** CENTRE LTD.

108 LONDON ROAD, BALDERTON, NEWARK, NOTTS. TEL: 0636 71475



OPEN 9am - 6pm Mon-Sat. Access and Visa cards accepted.



#### SUPERB HARD COVERS for your BBC Micro & Electron



BBC Cover: £10.95 (+£1.55 P&P) Electron Cover: £8.95 (+£1.00 P&P)

- Engineered in top quality high impact ABS very tough
- Super textured finish in cream to tone with your **BBC Micro**
- Looks good in the home Gives excellent protection
- Ideal for schools and colleges

#### TOP QUALITY MONITOR STAND

A high quality steel stand designed to combine a pleasing appearance with high rigidity. It bridges the BBC Micro and can be used with our hard cover. It has solid rubber feet and has a durable stove enamelled textured finish to match the BBC Micro. Platform dims. 455mm x 260mm. Overall height 105mm. Price: £17.95 (+ £2.00 Post & Packing).

	Sandbach Ches. CW11 9ET
MU4 Send to:	Tekform Products Grange Close
Address	
Name	
I enclose a cheque/P.O. for £	
Please send me BBC covers Electron covers S	tands

#### TWO WAYS TO ENSURE YOU GET

#### THE MICRO USER

#### **EVERY MONTH**

- Complete and mail subscription form on Page 165
- 2. Hand this form to your newsagent.

Please reserve me a copy of The Micro User magazine every month until further notice.

- ☐ I will collect
- ☐ I would like it delivered to my home.

Name_

Address.

Note to newsagent: The Micro User should be obtainable from your local wholesaler, or contact Steve Fletcher, Circulation Manager on 061-480 4153.

### CONTEX

Professional Software for the BBC Computer

#### THE CONTEX SPREADSHEET



The Contex Spreadsheet is one of the most versatile spreadsheet programs available for your BBC computer. It will process virtually any linancial or statistical column/row analysis calculations you care to give it. Prepare your home and office budgets, process accounts, complicated invoices, job costing, small stock control operations, financial and statistical modelling, expense evaluations, foreign exchange etc.

Loaded into your 32K RAM means there is no ROM to install (which will save multiple machine installations a small fortune!). Hundreds now in use. Compare the spec. this revised, enhanced version gives you:

Over 1,000 cells in upto 26 columns by 99 rows. Formulae, data or text into any cell. Individually variable widths (1-30 chrs) and decimal places for each column. Nine digit accuracy. Various printer format options. Row and column insert or delete with auto formulae adjust. Use all BBC functions, eg LOG, SIN, SQR. Many new functions, eg. MAX, MIN, SUM, discount factor. Autoreplicate formulae and data with auto adjust. Variables. Colour options. Save and restore to disc or tape. Four way scrolling. Headings stay on screen. Edit, search, help, model limits. Access to OS/DFS commands, eg. *DISC, *CAT. What-if modify command. Reference any cell by its id or by its headings. Full instruction booklet.

Cassette £9.99 Disc £12.99

#### TYPING TUTOR

Specifically designed for your BBC micro to teach and encourage you to fast touch typing. Professionally enhance your keyboard skills with the 90 smoothly graded lessons and the free format option. Hundreds in daily use and recommended by adult educational authorities this program will monitor your progress, intelligently check each line for errors and time you against the clock in words per minute. Optional audio key feedback, metronomic pacing and revised performance targets. Auto keyboard/finder display for all lessons including those special ones you optionally add to the course.

Cassette £9.99 Disc £11.99

Fast delivery. Discs supplied are 5½" please specify if 40 or 80 track required.

**CONTEX COMPUTING (B6)** 

15 Woodlands Close, Cople, Bedford MK44 3UE.

### **BBC Micro Fanatics Required**

Do you know your way around the BBC Micro – spend your spare time using it?

Beebugsoft – the software house of Beebug Publications Ltd. has vacancies for young persons with software expertise (Basic and/or Assembler) on the BBC Micro.

Continued expansion at BEEBUG-SOFT has created further vacancies for young persons with expertise on the BBC Micro.

Successful applicants will join a growing team of enthusiasts developing new software for the BBC Micro and Electron.

Work will be varied and, where possible, reflect the interests and expertise of the applicant. Salary according to experience.

Applications should be made in writing to the address below, and should include a full curriculum vitae together with the names of two referees.

The Software Manager
BEEBUGSOFT, PO BOX 50
ST. ALBANS, HERTS.

#### **BBC/ELECTRON ADVENTURES**

**NEW** WOODLAND TERROR £7.48 (CASS) £10.50 (DISC)

The sequel to FIRIENWOOD, many years ago an intrepid adventurer embarked on a quest for the Golden Bird of Paradise. Although successful, our hero released a sinister force which now lurks within the enchanted wood. Your mission is to return the terror to its original resting place and restore peace to an unhappy land!!! This is a complete game, knowledge of Firjenwood is not required

FIRIENWOOD £7.48 (CASS) £10.50 (DISC)

An evil wizard has captured the magic golden bird of paradise and imprisoned it in a weird castle in the middle of the enchanted Firienwood. Your quest is to find the bird and set it free, in return the bird will give you health and prosperity. BEWARE! many perils lie before you and every move is fraught with danger!!

BLUE DRAGON £7.48 (CASS) £10.50 (DISC)

Somewhere in a strange and dangerous land lies a fabulous treasure guarded by a fierce dragon. Can you survive the perils that await and recover the treasure or will you meet a nasty end!! What is making terrible slurping noises deep underground and what use is the strange black cloud? Play the game and find out.

SURVIVOR £7.48 (CASS) £10.50 (DISC)

The year is 1910 you are sailing on a steamer bound for Borneo when there is an explosion and the ship sinks. Shipwrecked on a tropical island can you survive and escape back to civilisation or will you end up in someones cooking pot!! There is more than one ending to this game, not all of them bad!

All the games are in machine code for fast responses and are text only. Please state which machine when ordering. Prices include VAT and postage within U.K. Cheques payable to MP SOFTWARE or write/phone with your ACCESS/VISA card No. Send S.A.E. for full range of programs and price list or ask your local dealer. Trade enquiries

We pay well for good original programs contact us today for more details.



#### SOFTWARE & SERVICES

165. SPITAL ROAD, BROMBOROUGH, MERSEYSIDE L62 2AE, 051-334 3472



Fifty high-quality programs for primary education Strongly recommended by educational authorities

MICRO (Model A and Model B)

SPECTRUM

WITH COLOUR, SOUND AND OTHER ENHANCEMENTS

£5-95 Paperback

PROGRAMS WRITTEN IN

STRUCTURED FORM

( All programs suit IK ZX31 )

£7.95 Paperback

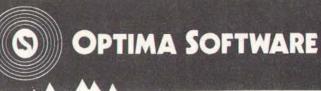
These programs cover a wealth of basic concepts every child will meet in primary education. They are produced by professional educators and have been thoroughly tested in a primary school. Designed to go beyond drill & practice they promote learning through interaction and discovery. Programs range from counting and simple arithmetic to ones dealing with volume, balance and direction, mostly in form of games. Each program is short but powerful and comes with full documentation.

EDUCARE 139a Sloane St. London SWIX 9AY

Please send copi	ies Educare's 50 on ZX81/Spectrum.
copi	ies Educare's 50 on BBC Micro.
I enclose cheque/por	stal order for £
Name	
Address	

Let your child benefit early - Send now

BBC



# SPECIALLY TEACHERS



#### DATEXT

This truly versatile teletext editor is gaining wide acceptance in the schools of Britain. And it's easy to see why. You can create a whole resource bank of Mode 7 pages as simply and quickly as putting pen to paper. Teachers can create:

- Libraries of colourful worksheets
- Personalised storybooks
- Electronic school newspapers
- Stimulating classroom displays

and a host of other fascinating applications. The disc version has several additional features such as a utility enabling you to incorporate Datext pages into your own programs.

#### MARKLIST

The program teachers have always wanted. Easy to understand and simple to use, Marklist allows even the most computer illiterate teachers to record and analyse their pupils' marks.

Handling marks for a single class or a whole year with equal ease, Marklist can sort and rank over 300 pupils in under 8 seconds. Pupil information need only be entered once. It can then be updated using straighforward editing commands. Developed in the classroom and given extensive trials, Marklist has been warmly received as an invaluable teachers' aid.

#### ORDER NOW!

Please send me Marklist  □ BBC 'B' cassette - £8.95  □ BBC 40-track disc - £10.95  □ BBC 80-track disc - £10.95	Add 50p p&p
Please send me Datext  □ BBC 'B' cassette - £8.95  □ BBC 40-track disc - £10.95  □ BBC 80-track disc - £10.95	(post free 2 or more)
Name	
Address	***************************************
***************************************	,,
☐ I enclose cheque for £	payable to Optima Software.
☐ I enclose Education Authority	order no
☐ I wish to pay by ☐ Access	□ Visa
No	Expiry date
	Signed

Optima Software, 36 St. Petersgate, Stockport SK1 1HL

#### **BBC/ELECTRON EDUCATIONAL SOFTWARE**

Our educational software is used in thousands of schools and homes throughout Great Britain.

**EDUCATIONAL 1** Tape £8.00 Disc £10.00 Hours of fun and learning for children aged 5 to 9 years.

Animated graphics will encourage children to enjoy counting, maths, spelling and telling the time. The tape includes 6 programs: MATH1, MATH2, CUBECOUNT, SHAPES, SPELL and CLOCK.

'An excellent mixture of games' . . . Personal Software Autumn 1983

**EDUCATIONAL 2** 

Tape £8.00 Disc £10.00 Although similar to Educational 1 this tape is more advanced and aimed at 7 to 12 year olds. The tape includes MATH1, MATH2, AREA, MEMORY, CUBECOUNT and SPELL.

**FUN WITH NUMBERS** Tape £8.00 Disc £10.00 This program will teach and test basic counting, addition and subtraction to 4 to 7 year olds. The tape includes COUNTING, ADDING and an arcade type game to exercise addition and subtraction. With sound and visual effects.

**FUN WITH WORDS** Tape £8.00 Disc £10.00 Start your fun with alphabet puzzle, continue your play with VOWELS, learn the difference between THERE and THEIR, have games with SUFFIXES and reward yourself with a game of HANGMAN.

'very good indeed' . . . A&B Computing - Jan/Feb 1984

JIGSAW AND SLIDING PUZZLES £7.95 Disc £9.95 There are 2 jigsaw and 4 sliding puzzles on a 3x3 and 4x4 grid. Each program starts off at an easy level to ensure initial success but gradually becomes harder. It helps children to develop spacial imagination and to solve problems. The tape includes: OBLONG, JIGSAW, HOUSE, NUMBERS, CLOWN and LETTERS

*** SPECIAL OFFER *** BUY THREE TITLES AND DEDUCT £4.00

Add 50p per order p&p. State BBC or ELECTRON

Cheque to:-GOLEM LTD, Dept B,
77 Qualitas, Bracknell, Berks, RG12 4QG.
Telephone: (0344) 50720 for BB

Let your BBC microcomputer control the outside world continuously through DAC148 digital-to-analogue convertors

- Especially designed for the 1MHz bus of the BBC and complies with all ACORN addressing recommendations.
- 4 to 8, 8-bit independent DACs on a single high quality PTH Eurocard.
- Output range of 0-5V or 0-10V is available according to your requirements.
- Completely self-contained, housed in an attractive metal case with power supply and all necessary connectors are available as an option.
- Simple to use and program in either BASIC or Assembly.
- The following options are available:

1) 4 channel DAC on Eurocard board £95 2) up to 4 extra channels for the above £11 each 3) 4 channel self-contained unit £150

- 4) up to 4 extra channels for the above £14 each 5) ready made power supply board £20
- * All prices include P&P. Please add VAT at 15%
- * Please specify the output voltage range when ordering.

#### **ASANTEK Electronics**

9 Luther way, Kings Park, Bradford, West Yorkshire BD2 1EX



#### **BBC JOYSTICK INTERFACE**

NOW YOU CAN USE ANY ATARITYPE JOYSTICKS ON YOUR BBC MICRO

- ★ No software required ★
- ★ Plugs into analogue port ★
  - ★ Two joystick sockets ★

Also available with one Quickshot II Joystick

£24.90



Tel: (0742) 752732





#### INTERFACES CONTROL

MAINS CONTROL UNIT - Enables the user under software control to switch 240v Mains appliances, up to 2.5Kw (10Amp Max.). Uses latest technology Solid State Relay (Opto-Isolated, Zero Crossover). Neon indicator. Comes with cable for direct connection to Unit 3. Upto TWO units may be connected to Unit 3 or FOUR may be connected direct to the computer via the Unit 4 (see

Double Ended ribbon cable for direct connection of one mains unit to User Port. (Special low price hence not supplied seperately) £2.99

ANALOGUE UNIT - This unit brings out all 15 lines to enable equipment to be connected to the BBC Analogue Port using commonly available terminals (4mm Banana type). Also  $4\times2$ -pin (Channel+Earth) Din type sockets for experimental use. All terminals are Colour Coded (set of matching plugs supplied) and Numbered. £25.95

DIGITAL UNIT - Enables connection to be made to the User-Port using commonly available terminals (4mm Banana type). Also ALL EIGHT Input/Output ports terminated in 2-pin Din type sockets. All terminals are Colour Coded (set of matching plugs supplied) and Numbered. £24.95

MAINS CONTROL 4-WAY ADAPTOR - This unit utilises the same ribbon cable used with Unit 1 to enable up to FOUR of the Mains Control Boxes to be linked to the computer User-Port, £16.95



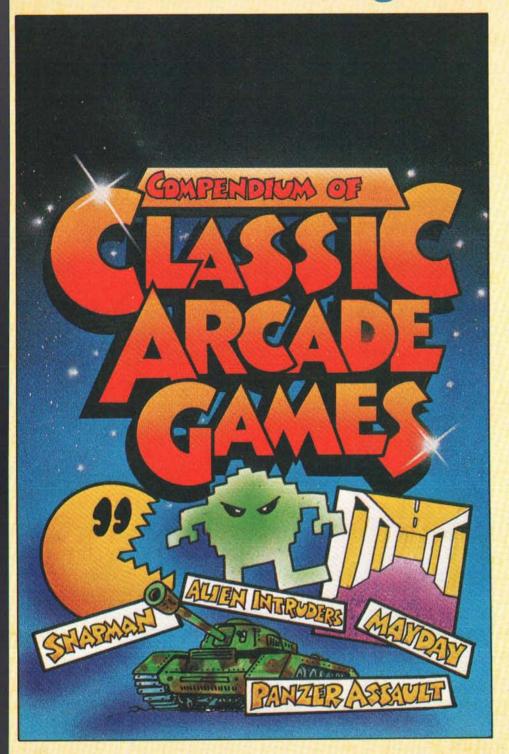


Accepted. To Order send Cheque/P.O.

(or telephone Credit Card number to 0272-562741 (Not Wednesday's). Please Add £1.50 P&P (any number of items) and 15% VAT to total.

INTERFACE COMPONENTS - 172 Burley Grove, Downend, Bristol, AVON, BS16 5QQ.

### Here's something SPECIAL from



#### BBC Micro tape £5.95 copy/copies of Please send ☐ BBC 40-track disc £7.95 Classic Arcade Games. ☐ BBC 80-track disc £7.95 ☐ Electron tape £5.95 ☐ I enclose cheque made payable to Database Publications for £ (Please tick) I wish to pay by \( \square\) Access _ Expiry date _ ☐ Visa No. _ Name Address . _ Tel: No. _ Post to: Classic Arcade Games offer, Micro User, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

### THE MICRO USER

We've commissioned four rip-roaring games for the BBC Micro and Electron

Three of this highpowered collection
are top-rate machine-code
versions of arcade classics
and the fourth is a
thrilling real-time
adventure game.
There's hours of
enjoyment and something
to suit everyone in this
unique value for money
collection

**SNAPMAN** – Guide your man through the maze as he munches energy pellets and avoids hostile aliens

#### ALIEN INTRUDERS -

With only your laser for protection you must destroy the waves of aliens who threaten to engulf you

PANZER ATTACK – You are a tank commander engaged in vicious combat against encircling enemy forces

MAYDAY — A futuristic adventure! As captain of an interstellar cruiser you must guide the sole survivor of a stricken space freighter through the wreckage of his craft. If you fail to recover those vital medical supplies a whole planet is doomed!



# MICROMAIL

# SIDEWAYS ROM expansion boards have been available now for a few months and I should like to know whether 16 ROM chips is the absolute maximum the BBC Micro can support.

With all the interesting new ROM chips appearing on the market almost daily now, I can foresee a day not so far hence when the expansion board will run out of slots – or are we in for a ROM expansion board expansion board?

Faced with a ROM space problem, can we copy ROM-based material to disc? I seem to remember reading that this can be done with a sideways RAM expansion board on the market.

Can the latter be fitted where there is already a ROM expansion board, I wonder?

The poor Beeb will soon be bursting at its seams! — S.M. Hopkinson, Croydon.

• 16 is the maximum you can use, as it's governed by the decoder used and the way the OS expects things to be set up.

Solidisk do allow you to transfer your ROM-based software to disc, but there might be some physical problems as far as space is concerned with your current sideways board.

In a rather more complicated fashion, you could also use the ROM boards that allow onboard RAM for transferring files from disc.

# Crammed solid

I'VE just completed listing "Deathwatch" game from your mag and I must congratulate you on a good choice, and having to use quick reactions and good skill to stay alive.

The only trouble is with the length of the gun barrel and the speed in which it moves.

Firstly when started the barrel is at full length, but the more you move left or right it shortens. This I can understand, so it can fire at sharp angles, but the barrel becomes so small  $(\frac{1}{4}$ in) it is very hard to guess the right angle (only by trial and error).

# Full to bustin' with 16 ROMs

Can it be lengthened and can it also be speeded up in turning to fire?

Can you also challenge yourself or any buffs to write in Deathwatch planes to help the defence by destroying tanks occasionally as do the helicopters to the guns and to make it more interesting if possible, have tanks attacking the invaders automatically without needing controls. — Simon Turner, Chesterfield, Derbyshire.

• We can't imagine how anyone could cram anything more into Deathwatch – but are sure some of our readers would welcome the challenge!

# Getting at the B side

WITH software becoming available on 3in discs made to suit the AMS layout, users of other makes of drive might like to know that I have successfully used an Opus two-sided drive to read both sides of an AMS disc, and hence to make an Opus version of the original.

There is no problem with A sides of discs – they look alike. To get at a B side, the Opus drive must be persuaded to take the AMS disc B side up.

To do this, cover the square notch neatly with sellotape and make sure it sits properly in the drive.

Since there is a risk of tape pushing the disc slightly out of its correct position and causing damage, it is best to regard this as a temporary trick for transferring files to another disc for permanent use rather than as a regular method for using the disc.

In any case, if you have read/

write heads for both sides of discs you don't want to be turning them over all the time. -Hylton Boothroyd, Gaydon, Warwick.

# Wordwise worry

AS one of your publication's most avid readers, and this being the first time I have had cause to write to you, may I start by saying how much I enjoy each issue.

If nothing else the advice and informed reviews of both hardware and software have saved me money and the various articles on programming have taught me a great deal.

Now to the point of my letter, I have a BBC model B with OS 1.20. It is fitted with Wordwise 1.10 and your March issue was the final prompt I needed to upgrade to discs.

I bought an Acorn DFS 0,90 upgrade kit, Disc Doctor, and a Teac 55F double sided 40/80 switchable drive.

Using Mike Cook's article in the January 1984 issue of The Micro User as a guide (the instructions with the DFS were awful) I installed everything and switched on. All seemed well until it came to using Wordwise.

Whenever I tried to save and then reload a long file of say 200 words or more I got "Disc fault 08 at" followed by two sector numbers.

Thinking it may be something to do with Wordwise I telephoned Computer Concepts. They said it was a question of incompatibility between the way DFS 0.90 handles random access files with some drives including the Teac.

When I telephoned Acorn

they said they were not aware of any problem and that it should work correctly. It doesn't.

I returned to the dealer — Twillstar Computers who, I must say, couldn't have been more helpful. Nothing they tried worked.

Furthermore they found other BBC machines in their stock fitted with Wordwise and DFS 0.90 that had the same fault.

In the end they managed to find a DFS 0.98 and this solved the problem. (I thank heavens I didn't go to a department store to buy the upgrade).

Since the word processing packages advertised in your pages often include Wordwise and Teac drives, you may consider drawing your readers' attention to this potential problem.

If Computer Concepts knew what I was talking about immediately it must be more than just a rare event. — M.J. Waldren, Kenton, Middlesex.

#### DFS dilemma

NOW that the 6502 second processor for the BBC has been released we find that to use it you must replace the existing DFS with the new one supplied.

This contains a piece of code which must be transferred across the Tube before the processor will work.

I suppose this means that all those people (myself included) who've been using the alternative DFSs, such as Watford Electronic's, will now either have to hope that Watford produce a compatible ROM or else change all those 62 file discs to 31 files.

One hell of a task if you've got

# MICROMAIL

#### From Page 177

any number and leaving you with a whole load of half empty discs.

This shouldn't have happened. So far as I know the Watford DFS only uses legal Acorn approved OS calls, so there was no reason to suspect when I bought the thing that it wouldn't work with a second processor.

After all, Acorn have been stressing all along that as long as the legal calls are used then everything would be all right.

The blame for this lies at Acorn's door – are they simply peeved that people have been using the alternatives or do they have a better reason?

I for one would be very interested to hear what they've got to say. Yours most peeved. – Pete Gaunt, London NW10.

# Let the ASA act

LIKE several of your readers, I too have been unable, either to get the issues of Laserbug for which I have paid or any response to letters.

May I suggest a course of

action to those similarly placed which might ensure that no one else suffers in future.

If the attention of the Advertising Standards Authority is drawn to the circumstances I am sure they would investigate and take appropriate action if satisfied that the complaint was justified.

The Authority publishes an excellent little booklet which describes exactly how to make a complaint and a copy can usually be found in the public library or the local Citizen's Advice Bureau. – J.A. Brook, Norton, Worcs.

# Another victim

MR Derbyshire, whose letter published in the April issue of The Micro User, is not the only victim of Laserbug.

I too sent a cheque on December 28 1983 and waited until February 14 1984 with still no reply.

I then sent them a letter asking them to at least acknowledge my £12 cheque which by my bank statement appears to have been transferred to their account.

Not having the decency even to do this, I was naturally angry, so I wrote to the magazine in which they advertise.

Argus Publications made efforts but to no avail. Argus suggested that I write to the Advertising Standards Authority which I did. Even their efforts failed.

And so I write to you asking you, as Mr Derbyshire has done, to put other potential "Subscribers" to Lazerbug on the alert. — D.V. Elliot, Slough, Berks.

#### Seawall mod

I AM one of the multitude who frequently think of writing to a magazine and then don't bother; but as its Friday 13th and my sub is due, here goes.

First, one more message of glowing praise to add to the great pile which you already have.

Second, thanks to Brian Spencer's letter about Enhanced Blackjack — I have been intending to do this mod ever since I ran the original program but I have never found the time — not that much time was needed!

I am not sufficiently musical to suggest an improvement to the Fiddler theme.

Third, a similar simple mod is necessary for the Seawall program from the April issue – this I have done while I was debugging my input.

There are two problems – when Ben is building the wall he turns his back on the wall before the final movement of placing the brick on the top.

Also when he catches the octopus he changes colour – and so does the wall since both are yellow to start with. The result is that there is nothing holding the sea back.

The second problem is solved by changing the bricks to red (the obvious choice) and the wall remains visible all the time. The first problem is handled by printing a "man right" at the end of the stacking routine.

A third change can avoid Ben turning his back on the wall after he has five bricks and the game is nearly over. He can immediately jump in to catch the octopus — G.S. Bainbridg, Yarm, Cleveland.

# JUST FOOLING.

I WAS intrigued by the article on the BBC 2 Micro, an exciting sounding machine with its many attributes including the 32 bit Z90 and its revolutionary input medium.

As an ex-telephone engineer I was delighted to read that British Telecom approve the new RS632 port, though the D to D interface puzzled me a little and I found it hard to en-Visi-age the 1MHz coach.

Notwithstanding, I read on, absorbed.

Only when I reached the software package "Visi-Bull" did I stop to check the front cover. Yes! April issue!

Well done. I liked the decoy April Fools Day program in Micromail.

How many others spotted it? I add my thanks to the thousands

before me for a brill mag. (if you'll pardon the vernacular) -A.R. Biggs, Rugeley, Staffs.

* * *

YOUR article on the new BBC 2 model "supercomp" (April issue) was warmly welcomed by all at Cuckooland Computers. We would like to acquaint you of our work on the new machine. We are shortly to market two further software packages for the new machine known as en_VIS_age and de_VIS_or.

en_VIS_age is an entirely new product which will make us a mint. All the operator needs to do is envisage which type of system he/she wants, tell the machine and hit Return. The BBC 2 will set itself up automatically.

en_VIS_age is obviously the

last word in emulation and will allow the BBC 2 to emulate the operation of several of the more common mainframes, including the CRAY 2 and the more common IBM machines.

de_VIS_or is a CAD program that allows virtually any item to be designed and built by the computer. In trials this has been so successful that, using its CAD facilities the computer recently learned to walk, and last week took over the boss's job.

All of this new software will be sold at the usual competitive rates Cuckooland is famous for (£25,000 for the C15 cassette version) and with such low prices we do not anticipate any piracy problems. — M. Lumsden (Chief Cuckoo), Newcastle-upon-Tyne.

420 COLOUR1 534 COLOUR3 535 PRINTTAB(12,15)CHR\$22 BTAB(12,16)CHR\$230TAB(12,17 ) CHR\$233 536 E=INKEY(50) 540 IF stack% 5 PROCmanre adv (12.15) 885 COLOUR1: PRINTTAB(XX+1 , Y%) CHR\$229TAB (X%+1, Y%+1) CH 935 COLOUR1: PRINTTAB(XX+1 , YZ) CHR\$229TAB (XX+1, YX+1) CH R\$231 1135 COLOUR1 1220 COLOUR1: REM rest of 1 ine unaltered

# Keyboard costs

I AM an owner of a BBC B fitted with an Acorn DFS. I have had this machine for nearly three

 Want to write to Micromail? The address is: Micromail, The Micro User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

years, and while the micro was still under guarantee it was necessary that a new keyboard should be fitted, due to the previous one having a "technical hitch".

About two weeks ago the new keyboard, which had lasted for two years, went severely wrong. The Return button, the Copy and Delete button, as well as the cursor up button all failed to function.

This prompted me to take the machine to my local dealer and thus get it fixed. After a week, the machine was ready, and accompanied by my mother we went to get it back.

The employee of the shop/company brought my BBC Micro back to me, and stuck on it was the bill. I expected the cost to be around £10-£18, but instead, much to my dismay and horror the bill came to a ludicrously high figure of £46.22.

Included in the price was VAT (£6), labour (£18), and the remainder was the price of the keyboard itself.

After being startled by this amount the man told me that the keyboard was guaranteed for three months. My question is, am I being done by a ridiculously expensive dealer or is this the regular price one must pay when one buys such a brilliant and "reliable" machine? — Graeme M. Black, Stanmore, Middlesex.

• If it really was the keyboard it would have taken all of 10 minutes to substitute one, so £18 seems ludicrous for labour. However, doing our sums, this leaves £22 for a complete keyboard, which seems good value.

# Phasing out GOTO

I HAVE been following with interest your correspondence on structured programming, and without adding to the mudslinging, I would like to offer my own experiences.

I started programming on a ZX81 about two and a half years ago and then graduated to a Microsoft machine (an

### Avoid that decimal tedium

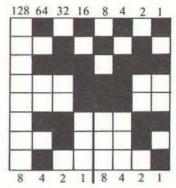
AS a newcomer to BBC Basic may I congratulate you on your interesting and highly informative series on graphics.

It certainly helped in areas where the User Guide tends to leave one floundering and frustrated. Particularly beneficial was your article on user-defined characters.

I do however find it rather tedious working out the decimal bit pattern of each byte from a possible 255 alternatives (0-255).

Anyone with the slightest clue about hex may find the system I use much simpler.

Instead of describing the



whole byte as a decimal number, I find it simpler to split the byte into two halves and describe each half in hex.

Because there are only 15

Decimal	Hex	
85	5	1 5
42	2	A
119	7	7
28	1	C
28	1	C
99	6	3
34	2	2
65	4	1

alternative ways of expressing each half byte (HEX 0-F), the character is much simpler and quicker to create. – A. Sergeant, Newark, Notts.

Osborne 1) before acquiring a BBC Micro in September.

For a long time my programs were of a typically spaghetti-like construction, but I eventually learned to make fairly effective use of GOSUBs and achieved some sort of structure.

Even so, much paperwork was needed to make the programs go properly, and debugging was a real headache.

Since owning the BBC, however, I have been gradually coming to terms with DEF-PROC and REPEAT . . . UNTIL, steadily reducing the number of GOTOs in my programs.

Finally I took the plunge and swore off GOTOs entirely. The reason for this was not because some guru said I should, but simply because the less GOTOs I used, the easier programming got.

I now find I can compose almost entirely on the machine (I am as lazy as the next person) and still achieve a well-structured program, as I am effectively forced to use a top-down approach.

Testing and debugging are a doddle, alterations are simplicity itself. And my programming time has been reduced by about 75 per cent.

Included in my renuciation are the ON...GOTO and ON...GOSUB constructs. This is not pedantry:

100 IF choice = 1 THEN PROCa

110 IF choice = 2 THEN PROCb

etc.

is infinitely easier to follow than, 100 ON choice GOSUB 1000,1100, etc.

and well worth the extra typing.

– John F. Armitage, Todmorden, Lancs.

on the screen.

If the Break key is pressed and the program is OLDed there is nothing there!

This must be one of a few bugs in the O.S. 1.2. It only appears to work with the G. (shorthand for GOTO) statement, and I would be interested to know if any other statements do it.

Although this bug will not drastically affect programming on the Beeb, it is interesting to know that Acorn still haven't got it quite right! — Ian Hassall, Leeds, Yorks.

#### A bug still lurks

I HAVE discovered an interesting bug for the BBC Micro, O.S. 1.2 and Basic II (it may work on earlier operating systems).

If the operator types in; 10G.10:G.10:... and so on until the "line full" beep sounds and then presses Return the computer starts to emit weird noises, which then ends in a three part chord!

This chord continues, without the operator being able to escape, leaving a flashing cursor

#### Digging Down Under

FIRSTLY congratulations on such a splendid and helpful magazine. Even though my copies arrive "down under" a couple of months late they are none the less an excellent inspiration to beginners like me.

I took Mr Lloyd's advice (page 110 of the September 1983 issue) and did a bit of digging in some other Acornsoft

Using the method he describes

# MICROMAIL

#### From Page 179

one can increase lives by changing address values, shown to the number of lives required.

Addresses are &FDD for Snapper, &117B for Rocket Raid and &1F04 for Monsters. You have to change Monsters from *RUN to *LOAD to get at the address and then call &E02 to get it running.

The only trouble with all three games is you won't know how many lives you have left unless you keep count. — Jeff Marchant, Alexandra, New Zealand.

#### Crackles traced

AFTER reading the letter in last month's issue about a socket snag I felt I should inform you about a similar fault which caused intermittent crackling from the speaker.

As time went on it became worse until it could be caused by as much as touching the machine.

On investigation it was found to be due to the power supply leads being incorrectly fitted to the PCB.

Instead of the spade terminals on the PCB being firmly gripped by the push-on connectors the terminal had slipped up the back of the push-on connector and was only being held in contact by the plastic sleeving, which was not sufficient for a good connection.

This could easily occur on other machines as there are five such terminals on every PCB (see diagram) – M. Klimck, Barrhead, Renfrewshire.

# Speed reduction

I THINK Barrel Battle is one of the best games I have typed in. I have two children, who of course are always much better than I am at the games, but this one I can even manage to play for a while without immediately losing a life! The children think it is really great too.

However having typed it in and checked it several times for mistakes, especially on screen 3 and with three barrels, the top and or bottom of the ladders sometimes disappear, making it impossible for one to continue.

Maybe this is supposed to happen, but I hope not.

I found the slow down program in the December issue of great use.

Is there any way of using a program like that to slow down bought games that one cannot easily list? — C.R.M. Sillars, Mersham, Kent.

• The program as it stands will work with some commercial software, but as &70 is used by a lot of programmers, a better place to locate the code should be found.

No single part of memory can be guaranteed free for all programs, so trial and error must be adopted. Two good areas to try are &880 and &380.

Obviously, as often you cannot break into the programs, the speed reducer must be loaded and run first.

If the following changes are made, and the program then loaded and run before the commercial program, it should work in a lot of cases.

I have tried it with Atomic Protector, from Optima, and achieved my best score yet.

The changes required are to delete lines 10-40 and change or insert the following lines:

50 MODE7
60 RX=3
70 PX=&880
75 SX=PX
120 LDX#40:LDY#RX
181 .CHANGE SEI
182 LDA#SXDIV256
183 STA &205
184 LDA#SXMOD256
185 STA &204
186 CLI
187 RTS
200 CALL CHANGE

Note that R% (see line 60) is the reduction factor, but tapes do not seem to load if this is higher than 3. It can be put up to 6 if you are using disc.

P% (see line 70) is the position that the code will locate. If &880 does not work, try other areas.

P. Davidson

# Commas caper

I HAVE always been under the impression that inverted commas could not be placed inside inverted commas within a PRINT statement, the reason being they would always cause an error. Yet this is not so.

While playing around with my BBC Micro I found to my amazement and quite by accident that they can be included inside themselves.

PRINT " " " gives an error missing "

PRINT " "HELLO" " gives us "No such variable".

The trick is to put them in pairs, that is PRINT """ will print " on the screen. Print " ""HELLO"" will print "HELLO".

This may be helpful to any

reader who is writing an educational program on BBC Basic and needs to get the little beasties on the screen. — Cyril G.H. Flanaghan, Nuneaton, Warks.

#### More games for the handicapped

THERE are lots of excellent arcade type games around which rely on manual dexterity on the keyboard, but I have been working with BBC Micros with a group of handicapped young people, who find most games are too fast for them.

They love your Frogs n' Dogs because they can manage to hit the space bar at the appropriate moment, and they can play Skittles from your Christmas Crackers tape.

Could you list any other programs which would operate on the space bar alone, or where keyboard entry is fairly simple and not dependent on speed?

Please will Micro User help to brighten the lives of accident victims and other handicapped people? – Mrs Margaret Jones, Leeds, Yorks.

• An excellent idea – can anybody out there invent or suggest any "single key" games for our less fortunate readers?

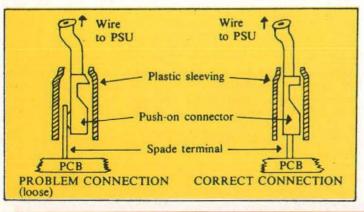
# Transfer charges

I WAS interested to read of Acornsoft's action against PCW and their offer to transfer tapes to disc – for only half price.

Personally, I have original Acornsoft tapes for several games and I am quite prepared to reward the superior skills of the man who wrote Sphinx Adventure or whatever.

But I have paid him, and also paid the enormous markup from manufacturer to distributor to dealer.

Now I would like to put them onto disc, but am not prepared to



pay again.

Anyone connected with a computer club will know how much copying goes on.

Acornsoft's scheme will not curb these activities, rather it will force others along the same path.

After the machine delays, the 0.1 OS saga, DFS delays, second processor delays, it would be a friendly gesture if this proposed charge were withdrawn for those who already have original tapes.—R.L. Sadler, Brentwood, Essex.

# Towards progress

IT was with a mixture of delighted amusement and

depressing sadness that I read Richard Grant's response to my letter in your April issue.

Amusement because it was precisely the analogy he used to contradict my argument that prompted my letter to you.

I had just received a second communication from the manufacturers of my year old car asking me to visit a dealer for checks and part replacement.

Sadness because Richard confuses the correction of design faults with technological progress.

We are, after all, talking of products which reach the market before all the faults – sorry bugs – have been eliminated.

I am all for **real** progress and will be first in line for the Mark 2 model.

However if computer

enthusiasts persist in confusing the correction of faults with progress it will be a long time before manufacturers behave responsibly towards we consumers. — R.D. Jackson, Sevenoaks, Kent.

# Instant diagnosis of faults

IN your March feature "Year of the Disc" your various contributors mention that the *ACCESS L command will not protect the user against inadvertent formatting.

The utility disc supplied by Oakleaf Computers has an "Intelligent Formatter" which not only refuses to format a disc containing locked files, but also checks whether or not a disc is formatted, and if it is it displays the catalogue of the disc, and asks if you wish to destroy the files.

As I discovered, the formatter and verifier contain diagnostics, which instead of displaying the usual disc or drive fault message, also gives a diagnosis of the fault, and suggests a cure.

In my case it was a bent chip lead, which I fixed in two minutes, but which would have cost me £10 or so had I returned it to a dealer.

I understand that Oakleaf do have arrangements to supply the utility disc to people who don't have their drives. – M.S. Chuda, Wigmore, Kent.



# MICROMAIL

# Basic Frogger

TO all lovers of A&F Frogger everywhere. Would you believe that your favourite program is written in Basic?

Well it is! If you don't believe me try this:

> LOAD "FROG2" PAGE=&E00 LIST

- Mrs P.M. Bevin.

# Obsolete tapes

I AM in the same unfortunate position as Mr Palmer (Jan 1984 issue of The Micro User). I recently bought a dual disc drive and now find that most of my bought taped programs cannot be transferred to disc for one (or both) of two reasons;

• There is an irritating and awkward shift of memory which means that long programs (which are just the sort which benefit from discs) often give "No room" and also means that machine code may not load in the correct place.

 Programs are often protected which means that it is impossible to copy them without corrupting them

them.

I have spent over a week now trying to transfer one particular program to disc without success, and am quite disgusted about this.

Some of my favourite programs are now dead ducks because I am not prepared to wait for them to boot from tape if I have a disc which is about one hundred times faster.

It has got to be recognised that tapes are rapidly becoming obsolete even for the home user.

— Glyn D. Williams, Bala, Gwynedd.

# Costly discs

I NOTE the letter in the January Micromail from Neil Palmer, of Bath.

As I now have a disc drive for my BBC I am determined to buy only programs on disc to avoid the time wasting transfering from tape to disc.

It seems however that a new racket has grown up. The price mark-up for the same program on tape to disc ranges from one example of take your pick to a premium of £4, with most charging £2 to £3.

As bulk discs probably cost £1 and you advertise then at £1.40 there is no justification for a mark-up of over £1. - Ralph C. Taylor, Penrhyndeudrafth, Gwynedd.

# Thanks!

WE thank you for writing us our computer game idea Frogs/'n' Dogs. We have played it and we think it is the best game ever.

I have taken it to school and Mr Rouce spoke about it in assembly. We thank you a lot. -Sharon King and Paul King, Buckden, Cambs.

And finally, with tongue firmly in cheek . . .

# When the rogues have you taped..

Dear Trev.

Why is it always me? What is this gift I have for finding the only uneven slab on the pavement? Why do I hold a fascination for pigeons? And why does fate, in the form of Andrea, keep picking on me?

I got home the other evening to find a message stuck to my micro's TV screen. "Having tea at Deidre's. You've been invited to the Romchester Rogues tonight, 7 o'clock in the Ram and Buffer. We'll see you there".

Well you know me and clubs, I hate them. The Romchester Rogues are a bunch of micro freaks who meet every Wednesday to criticise each other's programs and rip off software.

In fact, that's how they got their name. They were originally the Romchester ROG (Rip Off Group) but became the Rogues on the advice of their solicitor.

I'd been to one of their early meetings but hadn't liked it much. I spent half the time tripping over wires connecting cassette recorders. I don't think I saw a single bit (no pun intended) of programming all evening.

Still, for some reason I'd been invited and I was going. Besides, Andrea had swiped the aerial lead from my Beeb, so I had no choice

The first thing that happened as I stepped in the door was Clive (of "Not another GOTO" fame) grabbing my shoulder. "Good of you to come at such short notice. You're on in two minutes. What's your subject?"

"Subject?" I squeaked, suddenly realising that A. had "forgotten" to tell me that I'd been invited to speak.

"Yes, your subject. All the lads have seen you in the paper and we recorded your radio show and play it at the end of meetings for a laugh. They're dying to hear you live".

With that he dragged me onto the platform in front of the multitudes. Well, they weren't actually multitudes, more like 50 of them, but they were 50 too many.

"Ladies and gentleman. We all know Bob, or at least we've heard of him. He's now here to talk to us about . . . er", he looked at me expectantly.

"The BBC Micro", I squeaked and heard a gasp of mock astonishment from A. who was sitting next to Deidre in the front row.

Clive departed from the plinth and left me alone in front of them. Silence descended and all that could be heard was the clicking of Andrea's knitting needles and the soft whirr of the reel-to-reel copiers.

I shall draw a veil over the next 20 minutes except to say that they were the most humiliating in my life. I ran out of things to say in two minutes and foolishly asked if there were any questions.

If I'd have noticed my nasty nephew Nigel lurking at the back I wouldn't have been so stupid. As it was he asked me some of the most technical questions I'd ever heard. Even Clive looked puzzled by some of them.

A. later told me that Nigel had a couple of friends outside the hall with all the manuals

on the Beeb. They kept feeding him awkward questions to ask me. I got so confused with all this that by the end I even apologised personally for the fact that the Electron has no Mode 7.

Eventually Clive got up on the platform and, with the furtive air of someone involved in a mercy killing, brought the proceedings to an end.

I was amazed at the response. The applause was tremendous, there was even cheering. Some of the club members came forward to wring my hand in thanks, tears in their eyes. I was thinking that maybe I'd done better than I imagined until I heard Clive's parting words.

"Good man", he cried enthusiastically, "you pitched it just right. Everyone likes to think they know more than the bloke giving the talk and you had them all believing that".

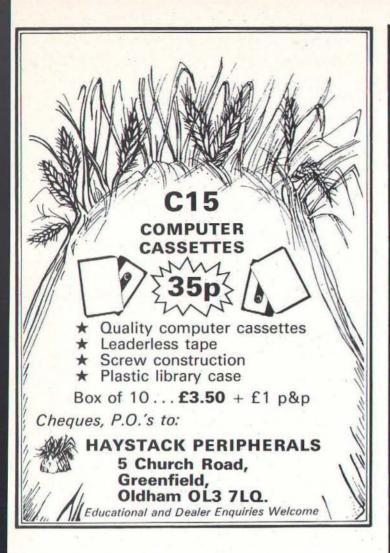
Dazed, I muttered that I couldn't remember quite what I'd said (which might be a good thing). "Don't worry", cried Clive, "the lads have got it all on tape. We'll sell you a copy, cheap".

With that I went downstairs to the bar and imbibed the drinks that the laughing Rogues were keen to buy me. Then I staggered home.

I still can't use my micro. A. won't give me the aerial lead back. She's afraid of what I might do.

Yours despondently,

Bob



# NEVER KNOWLINGLY UNDERSOLD — PRICE FOR PRICE, SERVICE FOR SERVICE

### **Printers** Computers £220.00 Epson RX80 BBC 'B' £346.90 Epson RX80 F/T £250.00 BBC 'B' + D/I £408.00 Epson FX80 £330.00 Electron (ex stock) £173 00 Epson MX80 £366.00 £430.00 Epson FX100 **Cumana Disc Drives** Daisywheels from £289.00 CSX100 £127.00 Monitors CSX200 £163.00 Cabel 14" £170.00 CSX400 £181.00 Microvitec 14" £195.00 + many more. Sanyo's from £199.00 £207.00 Saba TV/monitor **Eproms** Accessories Sideways ROM Board £38.00 Disc Interface £78.50 2764's POA 27128's P.O.A. £32.00 Wordwise Quickshot Joysticks from £7.78 P.O.A. 8271's SAE for lists - state machine. Add 80p carriage - small items. £7.00 carriage - large items.

# Leigh Computer Systems

Add 15% VAT to total

OFFICE 36 Derby Road, Hinckley, Leics, LE10 1QF

7 Coventry Road, Hinckley, Leics. Tel: 0455 612139

### INCREDIBLE ANIMATION BROUGHT TO YOUR BASIC PROGRAMS

# SIMONSOFT SPRITES VERSION TWO

@ £12.95 for the BBC 32K £15.95 on 40 or 80 track disc

An 18-FOLD INCREASE IN SPEED (BBC) of your own character designs makes this the FASTEST EVER screen movement seen in Basic programs. Amazing animation effects are available at a command, yet no knowledge of machine code is required. This incredible extension to your machine's facilities is RAM based and your whole program can be SAVED/LOADED at the same time as the control coding and sprite images (your character designs). The designs and the control routine need take as little as 8600 (1.5K) from the memory of your machine!

### LOOK AT THESE FEATURES:

1. SPRITE GENERATOR PROGRAMS to create your own sprite designs. All 16 colours may be used in each design, with characters as small as one pixel or as large as the  $24\times24$  pixel SUPERSPRITE. As you design the sprites they are automatically stored in the machine code control routine so that you can delete the generator program before writing your own Basic.

2. UPTO 48 SPRITES ON SCREEN with 12 separate sprite designs, each with 3

independently controlled clones.

W

NEWS KYY

ENEW:

INSTANT ANIMATION with two images in each sprite design. These are switched automatically as the sprite crosses the screen, allowing effects such as hopping frogs, running men, etc. ENEW?

4. COLLISION DETECTOR with a hit flag that is set to the number of any sprite overlapping with the sprite just moved. When the sprites move apart, there is no disruption of the sprite character designs.

5. ENLARGEMENT FACILITY of ×2, ×3, ×4, ×5 magnification of the

ENEWS ENEWS normal sprite size! Let your invaders loom out of the screen in 3D effects or use enlarged sprites throughout your program!

FOUR PRESET FLIGHT PATHS designed from the generator programs. Each path has 8 definable directions, with up to 255 steps allowed in each direction. Once sprites have been allocated to a path, they will move automatically as your program runs.

Both EOR and TRANSFER plotting of sprites to the screen are available.

8. A SPRITE LIBRARY of sprite designs ready for use in your programs with

'books' such as 'GHOSTS' and 'MEN'

9. SPRITE POSITION COORDINATE VARIABLES which are reset automatically by the control coding. As you move your designs, the 'old' images left behind are deleted automatically as well.

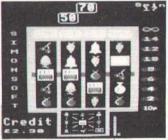
This amazing package includes control routines containing different combinations of the above features - choose the routine best suited to the program you want to write. A comprehensive colour manual, an introduction program and two arcade style demonstration games are also included in the package. Compatibility with all other Electrons make our animation routines ideal for serious programmers - and we won't claim royalties on programs you market using sprites!

N.B. Disc version may be bought on cassette for transferral to disc.

SUPERFRUIT @ £5.95 for the BBC 32K £8.95 on 40 or 80 track disc

Simply the best. Full colour high resolution graphics. Spinning reels with 'bounce'. Incredible gamble effects, hold, 3 types of gamble, swap reels, two-way nudge, nudge gambles, coin pile that shrinks/grows, great sound effects. Separate instruction pro-gram. This implementation is in a class of its own.

You would be fully justified in claiming that it is better than the real thing" — M. Field, Oxford.

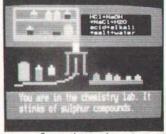


Screen photograph

ENEW?

CASTAWAY @ £8.95 for the BBC 32K The Three Island Adventure

A beautifully designed adventure with a wealth of puzzles of logic, imagination and wit. Tackle beanstalks, irate gardeners and prigish chemistry teachers! Brilliant use has been made of sound and Mode 7 graphics with full screen pictures. Set in varied terrain, from sanddunes to mansions, the adventure provides an exciting range of locations through which the castaway must pass in search of priceless treasure and cryptic clues.



Screen photograph

ORDERS TO:

SIMONSOFT, 25 TATHAM ROAD ABINGDON, OXON OX14 1QB TEL: 0235 24140

PROGRAMMERS - WE PAY 30% ROYALTIES FOR **EXCELLENT PROGRAMS** 

# **BEAM DESIGN**

- For architects, engineers, surveyors, etc.
- Analysis of simply supported beam with any combination of multiple point loads, u.d. loads and triangular loads.
- Steel beam design to BS.449 includes selection of suitable sections in single and double configurations from standard range of RSJs, Channels, UBs and UCs.
- Timber design to CP.112 permits choice of species/grade and single, double or triple built-up members.
- Allows user to instantly switch between steel and timber modes and 'browse' through the full range of suitable sections.
- Output to printer is suitable for L.A. checking and includes all loading data, reactions, max. bending moment, deflection and full details of chosen sections.
- Graphics version displays BM and SF diagrams.
- Available for BBC model B, 1.2 OS. Cassette £40, disc £45.

Send SAE for specification sheet showing sample printout

BEAMSCAN, 20 Vaughan Avenue, Hendon, London NW4 4HU

# AT LAST!!

●●● 8-DFS (●●● 8-INCH FLOPPY DISK FILING SYSTEM FOR THE BBC!

- * Fully Compatible with ACORN DFS
- Approved by ACORN COMPUTERS Ltd.
- ☆ Nearly 1.2 Mega-bytes of on-line Storage
- ☆ 8 User Directories 248 Files!

8-DFS ROM Complete With Installation Manual £44.95 + £1.50 p&p

Manual Available Separately £3.00

VOGAN Products, The White House, 21 Grove Road, Hazlemere, Bucks., HP15 7QY

# TOP QUALITY PRINTERS! ROCK BOTTOM PRICES!

**EPSON RX80** SHINWA CP80 £194 + VAT EPSON RX80F/T £248 + VAT JUKI 6100 Daisy-£358 + VAT £218 + VAT £298 + VAT **EPSON FX80** £328 + VAT wheel EPSON MX100 £378 + VAT **GEMINI 510X** EPSON FX100 £475 + VAT **GEMINI 515X** 

CUMANA DISK DRIVES
From £198 + VAT
We also have large stocks of super

WW We also have large stocks of sundries, etc.

FORM write now to:

Datatech Ltd (TMU)

8 Bellingham Close, Bury, Lancs. BL8 2TU.

Tel: 061-764 5579

# S.P. ELECTRONICS

Acorn Electron (phone for availability)	£199.00
BBC Model B 1.2 O.S.	£399.00
CP80 Printer + DELTA (inc. cable)	£249.00
Disc Operating System	
Disc Drives	
Disc Operating System D-Density	
G3 WHO RTTY PROGRAM (TAPE)	
G3 WHO RTTY PROGRAM (EPROM VERSION)	
Circuit board for RTTY decoder (inc. instructions)	
Star Delta 10X Printer (inc. cable)	
Joysticks (pair) self centering + analogue	
Printer Cable (Centronics)	
Speech Synthesis	
Disc Doctor	£33.00
WORDWISE Word Processor	
Transferred in the same of the	L35.00

Wide selection of software, books, leads, plugs, etc. SAE for full list. All available Mail Order

48 Linby Road, Hucknall, Notts. NG15 7TS. Tel: 0602 640377 (all

(all prices include VAT)

All prices apply while stocks last.

Carriage extra

# MODULAR MICROCOMPUTER CONSOLES FOR SCHOOLS, HOMES AND OFFICES

Just 2 examples of our extensive range of consoles. This system is easily adapted to suit your personal requirement and can be readily expanded upon. The consoles support your TV/monitor safely above your micro and provide safe storage for disk drive/s, cassette recorder, books etc. The sturdy, well designed, mild steel construction also enables your micro to be stored safely underneath when not in use.

All consoles are formed with double bends to provide a completely safe edge to the front and rear whilst the bottom edge has rubber trim for safe use on desks etc. Attractive textured finish in either black or BBC colour match. Whilst these consoles are designed for the BBC micro they lend themselves perfectly to a variety of other models.

Write or phone for full colour brochure including dimensions and price list.





From £19.75 + VAT

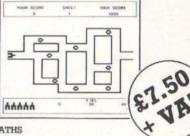
TRADE, EDUCATIONAL ENQUIRIES WELCOME, DISCOUNTS AVAILABLE

# J & W BUNCE

Thorpe Industrial Estate, Unit 3, Crabtree Road, Thorpe, Egham, Surrey TW20 8RN. Egham (0784) 33555

# Educational Software Ogical SOFTWARE

HIGH QUALITY CASSETTE-BASED SOFTWARE FOR THE BBC MICROCOMPUTER (32K).



### NIGHTMARE MATHS

Get through the space-maze solving maths problems on the way, but watch out for the comets, laserbolts and meteors. High score table and extra 'sheets' for the successful. Three levels of difficulty, with graded hazards too. Age 10 upwards.

### PICTURE

Use this package to create new characters and combine them in high resolution pictures. Characters and pictures can be saved and used in your own programs. Sample character sets and pictures included.

# THE ESTABLISHMENT AND SHIPWRECKED.

A two program package of simple text adventures, featuring fantasy environments. An ideal stimulus for creative writing and art.



### Available from:-

LOGICAL EDUCATIONAL SOFTWARE, 12, Rowditch Avenue, Derby, DE3 3LD

(Please add 60 pence P + P (inc VAT) to order total).



# special Offer from Vigle

Complete disc system for the BBC Model B

 Package assumes you own a BBC Model B with switched-mode power supply plus 1.2 Operating System



# Offer includes:

- 100K full height Olivetti Disc Drive (as used by Acorn), including case and all leads
- Disc Interface (call at factory for a FREE fitting whilst you wait) UXBRIDGE ROAD
- User Guide
- Formatting Disc
- All necessary leads

Unit 7 Trumpers Way Hanwell W7 2QA Telephone: (01) 843 9903

Disc Drive and Interface

***** *********** mar ununun han min min min

ase send me (state number recquired) (here state number recquired)

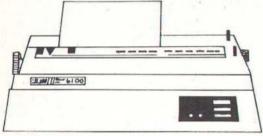
TRUMPERS WAY, HANWELL, WY 2 OA

Viculary COMPONER SUPPLIES UNITY 1. The se send me state number required)

Due to a misunderstanding entirely unconnected with Viglen and circumstances beyond Viglen's control incorrect details appeared in the previous issue Viglen sincerely hope that this time the information in this advert is correct and looking forward to receiving your orders.

# MAHH branches out

to offer the best value in monitors & printers



# PRINTERS

EPSON

Daisy Wheel-JUKI 6100

Daisy wheel printer 18 cps: bidirectional & logic seeking. 10, 12, 15 cPl & proportional spacing up to 220 characters per line.

2K Buffer, incl. cables £389.00 inc. VAT



# 14" Std-Res \$199.95 inc. VAT Med-Res Hi-Res

QUALITY



as tractor feed. **£379.00** inc. VAT **Epson RX80 F/T.** A most reliable printer at a realistic price. Offers 100 characters per second.

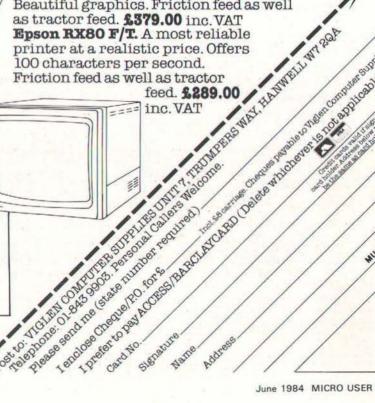
Friction feed as well as tractor



Microvitec 1431

£340.00 inc. VAT

\$442.00 inc. VAT





# INTRODUCING THE TEAC 3" DISC DRIVE

Single 100K £159 inc VAT + £8 carriage Cased, and price includes cables, utilities disc and manual.



Post to: VIGLEN COMPUTER SUPPLIES, UNIT 7, TRUMPERS WAY, HANWELL, LONDON W7 2QA.

Please send me ______ (qty) TEAC 3" Disc Drive at £159 each + £8 carriage. I enclose Cheque/P.O. for £ _____

made out to VIGLEN COMPUTER SUPPLIES or debit my ACCESS/BARCLAYCARD No. _____

Name _____ Signature _____



Ideal for home, school or business!

Address

This unique total control consol has been individually seeigned to help you keep your hardware clean, tidy and selfe! No more measy wires, no more feer of damage or neetlation in transporting from one place to another. Just ook at the features incorporated as options!

Simply choose the type you wish to purchase or

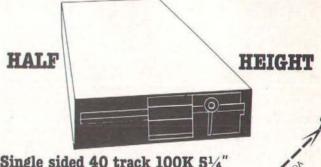




	Left SOCKETAVENINGES SQUARE OF SHIRLS and sucket.	CHOIC CASE TO CASE TO A CONTROL OF CASE OF CASE OF CASE TO A CASE OF C	the near	est tube	
	and the same	Find to beddie communication control of the communication of the control of the c	9000ECL BT	758	
9.4	PRODUCT STREET, STREET	OPTIONS	THET	VAT I	TOTAL
	This is filled mathe the unit	BASIC SHELL WITH BASIC - Filters	30.00	400	
A STATE OF THE PARTY OF THE PAR	by sucking the many six.	SOCKETS OFFICE Frame	-	100	
Control of the last of the las		POWER SUPPLY - French Involv 2m Frenchmark	90.00	450	
		COOLING FAN - Fring	15:00	2.25	
	Stand .	Please add CCSC on total for p & a	-	YOTAL	6
	Finance convergence on the control of the cannot be found of the cannot be found of the conflicty grown expect content.  * Earth sentent top to 3 can be fitted bely you play	I naccopy my chequestric) for it is partied to pay with my ACCESS/MARCI, AYEARD Card No.  Card No.  Supposed:  Name	Christin prin	ilmur or	r applicable
THE RESIDENCE OF	year return, public; etc. Second only now hard weeks	1 Address			

# TEC from VIGLEN As used by Cumana

**BBC** Compatible Disc Drive systems at

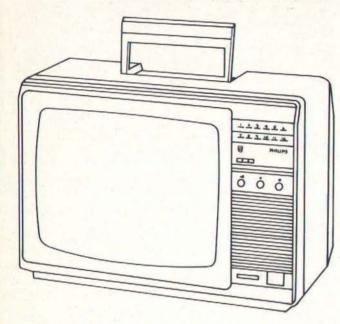


TEC Single sided 40 track 100K 5¹/₄" Disc Drive £129 inc VAT TEC Double Sided 80 track 400K 5¹/₄" Disc Drive £189 inc VAT

All disc drives come complete with Professional Case · Ribbon cable to connect to BBC Micro · Power cable to connect to BBC Micro · Comprehensive Manual · Formatting and utilities disc.

MU

# PHILIPS 14" COLOUR MONITOR/COLOUR T.V.

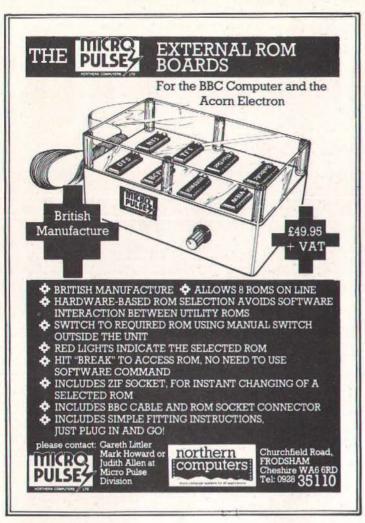


- Sparkling picture in seconds.
- Reliability and performance excellent.
- Headphone Socket, can also be connected to tape recorder.
- Loudspeaker mute switch.
- Retractable carrying handle.
- Metallic silver finish with restful dark picture surround.
- Includes RGB lead connecting direct to your BBC Micro.
- £235 inc. VAT.

See the Viglen full page ads to order: Viglen Disk Drives, Printers and the other monitors featured.

Unit 7, Trumpers Way, Hanwell W7 2QA. Telephone: 01-843 9903.





# RIVE+MIRROR

Assembled in Britain Robust metal case, BBC beige colour Complete with BBC cable Fully compatible with Acorn BBC DFS Can be linked in tandem with 5½" disc drive for easy transfer of software Red/Green LED indicates which side of the disc is in use Includes 38 page disc operating system manual Includes 40/80 track formatter utility disc Uses standard Hitachi hard-cased 3" discs (automatic steel shutter protects exposed part of disc surface) Additional double -sided 3" discs available ex-stock

DUAL 3 INCH (2 x 100K) DISC DRIVE £299.95

MIRROR 3" CASSETTE-to-DISC utility program Discette Up-loads approx 20 cassette-based programs ... (10 on each side of the disc) ... 29.00 = VAT

Trade enquiries welcome

please contact: Gareth Littler
Mark Howard or
Judith Allen at
Micro Pulse

Micro Pulse

computers

Churchfield Road, FRODSHAM

# ADVERTISERS INDEX

A & F Software	116	Kosmost Software	133, 134
Aardvark Software	159	Leigh Computer Syste	
Acornsoft	80.81	Level 9 Computing	59
Alligata	126	Lincoln Microsystems	
Ampalsoft	121	Logical Educational Se	
AMS	34	LVL Computertown	84,85
Asantek Electronics	174	M Tec Computer Servi	
	2, 33, 155	Mannesmann Tally	192
	184	Mayfair Micros	167
Beam Design			
Beebugsoft	170, 172	Merlin Computer Prod	
Bel Tech	141	Micro Aid	135
Benwick Electronics	159	Micro Power 7, 16, 1	7, 113, 196
Big K	58	Micro User Show	106, 107
Bridge Software	142	Microtest	151, 155
British Micro	191	Microware	71
C Tech C/WP	104	Microworld	28
C/WP	63	Midwich Computer	46
Cambridge Computer		MLC	156
Consultants	44	MP Software & Service	es 173
Cambridge Computer S	tore 160	MRM Software	24
Carson Developments	159	Musicsoft	156
Cases Computer Simula	ations 151	MW Systems	15
Century Systems	65	National Micro	100
Chalksoft	160		0, 168, 169
Chase Data	14	Newark Video Centre	171
Cheetah Marketing	48,112	Northern Computers	190
Clares Micro Supplies	49	Optima Software	128, 173
	149	Opus Supplies	46, 47, 64
Commotion	2,60,75	P & H Electronics	35
Computer Concepts			
Computer Marketplace	100	Pace	95,176
Computerama	3	Paean Systems	135
Comsoft	152, 181	Phi Mag Systems	115
Contex Computing	172	Primasoft	159
Cumana	122, 123	Prism Business System	
DA Computers	167	Proxima Personal Cor	
Data Technologies	124	Software	144
Datapen	150	Qual Soft	127
Datatech	184	Ricksoft	155
Dataware	137	SP Electronics	184
<b>Dedicated Microproces</b>	sors 190	Screenplay	120
Dee Kay Systems	139	Sequential Software	149
Display Distribution	6	Silent Computers	155
Doublemode	146	Silverlind	142
Dynabyte Software	150	Simonsoft	183
Educare	173	Sir Computers	93
Electronequip	10,11	Softeach	92
	152	Software Division	156
Epic Software	56	Software Invasion	193
Epson			
Garland Educational So		Solidisk Technology	12, 13
	20,21,22	Spider Systems	166
General Northern	1982	Squirrel Software	160
Microcomputers	128	Stack	141
Golem	174	Superior Software	195
GSL	70,90	System Software	142, 162
GTM Computers	94	Tech OP	102
HCR Electronics	152	Technomatic	8, 9, 51
Haystack Peripherals	183	Tekform	171
Hewson Consultants	98	Torch	18, 19, 76
Home & Business		Tutorial Software	144
Computers	109	U Microcomputers	152
Hornby Software	160	Viglen	185-189
Integrex	108	Vine Micros	146
Interface Components	174	Vogan Products	184
Ixion	167	Voltmace	194
J & W Bunce	184		36-42
Vay Foo Committee Design		Watford Electronics	134
Kay-Ess Computer Prod	122	Wildings	174
Kelan Engineering	133	Wizard Development	174

# INSTRUMENTATION AND CONTROL FOR THE BBC

Analogue port distribution unit. Digital port distribution unit. Human eye response light sensor. Liquid flow sensor & amplifier, pH sensor & amplifier. Thermistor & Platimum temperature sensors. RELAYS, DC, AC, VMOS up to 13A. Digitaly controlled 13A dimmers. Frequency measurement attachment. Bipolar input adaptors. EDUCATIONAL PACKAGE. AUTO-DIALLING FROM DATA BASE PACKAGE. Dual 8 bit Digital/Analogue converter. Fast 8 bit A/D converter. Eight way opto-isolated unit, for DC and/or AC Input-Output. Stepper motors, Digital linear actuators, DC motors & gearboxes. DC or AC tachogenerators, solenoids, valves & position encoders. Cassette software supplied with each item. No tools required to assemble and run the hardware, or special knowledge needed. RS232-423 eight way distribution unit, software controlled. RS232-423 serial to eight bit parallel converter and parallel to serial models. Please send your enquiries to:

# DEDICATED MICROPROCESSORS LTD.

MICRO-COMPUTERS FOR HEALTH, INDUSTRY & COMMERCE

Regeneration House, School Road, North Acton, London NW10 6TD. Tel: 01-965 2841

# THE MT80. SHAPEI BY EXPERIENCE

You are looking at the sleek, ultra modern lines of the latest dot matrix printer from Mannesmann Tally; the people who probably have more experience in computer printers than just about anyone.

The MT80 is a high quality, low cost 80 column, 80 cps printer that will complement any of today's micros in looks and quality; in either the home or the office.

It has been designed with industry-

compatible interfaces in hardware and software.

Experience tells us exactly what you want from a printer—The MT80 has dual density dot addressable and line graphics. An easy change, long life cassette ribbon. It can handle both tractor-fed fanfold and single sheet paper. There is a unique quick tear facility giving you a clean cut along the entire width of the paper. And it even has an optional

sound reduction kit for those of you who like to hear yourselves think.

But best of all, it comes equipped with another valuable asset. A very attractive price tag.

Contact your nearest distributor or send for our colour literature.

Mannesmann Tally Limited, Molly Millars Lane, Wokingham, Berkshire RG11 2QT. Tel: (0734) 788711. Telex: 847028



GRAFPAI ...for as many uses as YOU can imagine!



With Grafpad you can now add a new dimension to your computer enjoyment, but most important, it helps you create your own application programmes by the simple use of the Grafpad!

The Grafpad comes complete with a cassette comprising two programmes.

## THE FIRST PROGRAMME

displays the co-ordinates of your screen area. The co-ordinates are based on the screen with a grid size of 1023 x 1279 pixel, also in the Grafpad giving you a grid size of 320 x 256 pixels!

# THE SECOND PROGRAMME

provides you with the utilities for circles, squares, triangles, free-hand, erasing line-drawing etc, and of course, full "Fill-in" facility in 16 different colours by the simple use of the pen!

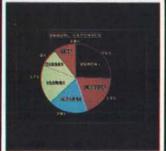
Draw from a simple apple to a computer circuit - store in cassette or disk, perhaps transfer direct to a printer - in black and white or full glorious colour!

Purchase unique C.A.D. (Computer Aided Designs) programme and add further enjoyment and professionalism to your computer designs!

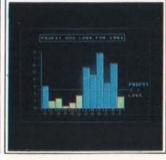
The Grafpad comes complete with Operational Manual, Programmes, The Grafpad and Pen and it simply plugs in your computer.

(Size: 25mm height x 55mm width x 260mm depth) Weight: 1.2 kg (Gross)













(The above designs were drawn by a 12-year-old at our showrooms!)

- **DEALER INQUIRIES WELCOMED**
- SPECIAL DISCOUNTS FOR EDUCATIONAL **AUTHORITIES**

# BRITISH MICR

A HEGOTRON GROUP COMPANY

Unit Q2, Penfold Works, Imperial Way, Watford, HERTS WD2 4YY TEL: (0923) 48222. TELEX: 946024



BY IELEPHONE:
If you are an American Express,
Barclaycard, Diners Club or Access
Card Holder simply telephone us giving
your Card No., Name, Address and
item(s) required and your orders will be
dispatched within 48 hours!

Post to: BRITISH MICRO, UNIT Q2, PENFOLD WORKS IMPERIAL WAY, WATFORD, HERTS. WD2 4YY

Simply fill in the coupon, enclosing your cheque/P.O. made payable to: BRITISH MICRO, or use the special section for Credit Card Holders, and post to the address below. Please allow 14 days for delivery

BBC		AIR SPECTRUM Please tick)		COMMODORE 6	
Qty.	Item	Ex. VAT	Inc. VAT	Total	
	Grafpad Complete	£125.00	£143.75		
13	C.A.D. Programme	£18.00	£20.70		
	F	ostage, Packing & I	nsurance	£5.00	
	my cheque/P.O. for £		TOTAL	£	

I prefer to pay with my American Express	, Barclaycard,	Diners,	Access Card
(Please cross out whichever is not application)	able)		

CARD NO.	
SIGNATURE	
NAME	
ADDRESS	

Address above must be the same as card holder.



# SOFTWARE INVASION. Let excitement invade your home computer!

Travel to Alpha Centauri. Enter the Vortex. Command the ground missiles, or join the shoot-out at the O.K. Corral!





# GUNSMOKE

...the movement of the saloon-bar door was all the warning he needed! At the speed of light his hand moved toward his holster, while a sixth sense warned him of floor window... 3D ACTION, SOUND EFFECTS, BEAUTIFUL GRAPHICS BBC MODEL B

### 3D BOMB ALLEY

... the continued thunder of the hissing ground missiles had long now deafened him - unless he had some of those pombers down, the fleet, in the small stretch of water was a sitting duck...
3D ACTION. SOUND EFFECTS, BEAUTIFUL GRAPHICS BBC MODEL B 67.95 CASSETTE \$11.95 DISK



... he punched the key, and the control monitor filled with the picture of hug-eyed wasps attacking from their volcanic nest; decisively he dived to the left and his laser gun burst into action... 3D ACTION, EXPLOSIVE SOUND EFFECTS 8BC MODEL B £7.95 CASSETTE £11.95 DISK





# Distributors, Multiple Store and Retailer Group inquiries invited

 Available from WH Smith, HMV, all Spectrum shops and over 500 retail outlets in the U.K.



ere was no escape, he had to enter the Vortex and bet on his skills! grabbed the manual controls and with determination fired both per deck guns... EXCELLENT SOUND KEYBOARD OR JOYSTICK, BBC MODEL B SO AVAILABLE ON ACORN ELECTRON CASSETTE FOR £7.95.

# AGLES WING

. he glanced at his fuel levels, a few more seconds of trying ad to swing round through the burst of fire to reach the Doc e knew, in two minutes the game could be over ... GRAPH COMBAT, SUPERB CONDITIONS, BBC MODEL B. 27.5

### pooks & Spiders

... perhaps, very slowly, he could reach the cellar – quietly he limbing down, his loot slipped as the giant spider dived towar iOUND EFFECTS, EXCELLENT GRAPHICS, BBC MOD 7.95 CASSETTE, £11.95 DISK.

VERSEAS ORDERS: Please add £0.75p per g



50 Elborough St., Southfields, London SW18 5DN

Do you write your own programmes? If you have an unusual programme which can meet our standards you could be earning more than £250 per week. Why not take advantage of our sought after reputation. Write now!

SOFTWARE INVASION 50 ELBOROUGH STREET SOUTHFIELDS LONDON SW18 5DN

e BBC Micro Model B

3	80 TRACK	40 TRACK	DISK	TAPE	QNTY	GAMES
						VORTEX
						VORTEX (Acorn Electron )
						ATTACK ON ALPHACENTOURI
						30-BOMB ALLEY
						EAGLES WING
			1			GUNSMOKE EAGLES WING SPOOKS & SPIDERS

I enclose my Cheque/P.O. for £.

Name .

Address.

I am a Distributer/Multiple/Retailer/Dealer Please contact me (please delete whichever not applicable).

# Increase your fire power!

# More than just a joystick—a system

- ▲ Nylon encased—Steel shafted joystick with ball and socket joint.
- ▲ Fast sprung return to centre.
- Graphite wiper linear potentiometers.
- ▲ 12 Months Guarantee.
- ▲ 7 day Money back Guarantee (on Hardware).

# Complete control at your fingertips

A superb joystick and a keypad for the price of either one. Plus the software to integrate it into the computer's system. One handset will work on it's own in the A/D port as a joystick and two fire buttons. Joystick is immediately compatible with ACORNSOFT and

The interface joins together the analogue and the user ports to use the full keypads giving a total of 24 user definable keys. The interface can also be used as a splitter for the A/D port to take two items at the same time, e.g. joystick and lightpen.

DELTA DRIVER on cassette or disc: Two programs on each cassette or disc. One converts machine code programs from the keyboard to the joystick or keypad, with adjustable sensitivity on the joystick and will run on any O.S. The second program (needs O.S. 1.0 or later and an interface) duplicates any keyboard keys on the keypads, in the operating system, so that it can become a

numeric keypad or will take on the function keys.

Numerous stockists nationwide or direct from us.

detailed information.



Made in England

DELTA 146 HANDSET £14.95 DELTA 14b/1 A/D/USER PORT INTERFACE £14.85 DELTA DRIVER CASSETTE £5.95 or DISC £9.95 Prices include VAT and P&P.

tmace*delta 14b* 

PARK DRIVE BALDOCK **HERTS** Tel: (0462) 894410

**VOLTMACE LTD** 

# TWO SENSATIONAL NEW RELEASES FROM SUPERIOR SOFTWARE



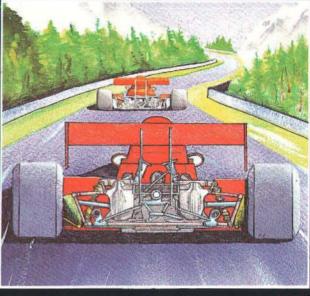












A highly-addictive multi-stage 3D race game. You steer your car left and right, accelerate and decelerate as the opposing cars weave about the road. There are five different stages including night, snow, desert, and riverside scenes. To qualify for the next stage, you must finish in the top twelve. Incredible graphics give the impression that you really are taking part in the race. Highly recommended, and destined to become another top-seller for Superior Software.

•••NEW RELEASE•••

OUR PROGRAMS ARE NOW AVAILABLE FROM OVER 1000 OUTLETS THROUGHOUT THE UK AND OVERSERS. SEE YOUR LOCAL DEALER!







An excellent game, made possible on the BBC computer only by the unique use of a dual-screen display and specially written plotting routines. You are a tank gunner looking out onto a mountain plateau. You see the distant mountains and the pyramid obstacles — and also the enemy tank. Your task is to shoot it before it shoots you. A scanner is displayed in the bottom right-hand corner of the screen. This displays the position of the enemy tank relative to you. You can then turn to get the tank in view. The next stage is to position the tank in the rectangular viewfinder by fine adjustments of your controls. (KEYBOARD or JOYSTICKS)

OOONEW RELEASEOOD

WE PAY UP TO 20% ROYALTIES FOR HIGH QUALITY BBC MICRO AND ELECTRON PROGRAMS



# SUPERIOR SOFTWARE LTD.

Dept. BMU5, Regent House, Skinner Lane, Leeds 7 Tel: 0532 459453

- All our software is available before we advertise.
- All our software is despatched within 48 hours by first-class post.
- In the unlikely event that any of our software fails to load, return your cassette to us and we will immediately send a replacement.

